AD-A069 607 AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OH F/G 14/2
A SUBHUMAN PRIMATE RESTRAINT SYSTEM. (U)
DEC 78 C M OLOFF, W L FINCH
UNCLASSIFIED AMRL-TR-78-88 NL

1 OF 1
AD
A069607

END
DATE
FILMED
7-79
DDC

AMRL-TR-78-88

A SUBHUMAN PRIMATE RESTRAINT SYSTEM

CLARENCE M. OLOFF
WILLIAM L. FINCH

DECEMBER 1978

Approved for public release; distribution unlimited.

AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

NOTICES

TECHNICAL REVIEW AND APPROVAL

AMRL-TR-78-88

The experiments reported herein were conducted according to the "Guide for the Care and Use of Laboratory Animals," Institute of Laboratory Animal Resources, National Research Council.

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

Clyde R. Replogle

CLYDE R. REPLOGLE, PhD
Chief
Manned Systems Effectiveness Division
Aerospace Medical Research Laboratory

AIR FORCE/56780/11 January 1979 — 100

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DDC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER
14 AMRL-TR-78-88

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
6 A SUBHUMAN PRIMATE RESTRAINT SYSTEM.

5. TYPE OF REPORT & PERIOD COVERED
9 Technical Report,

6. PERFORMING ORG. REPORT NUMBER
N/A

7. AUTHOR(s)
10 Clarence M. Oloff
William L. Finch

8. CONTRACT OR GRANT NUMBER(s)
N/A

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Aerospace Medical Research Laboratory
Aerospace Medical Division, Air Force Systems Command, Wright-Patterson Air Force Base, OH 45433

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
62202F, 7222 - 08 - 73
16 17

11. CONTROLLING OFFICE NAME AND ADDRESS
(Same as block 9)
12 56p. 11

12. REPORT DATE
Dec [redacted]978

13. NUMBER OF PAGES
56

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

15. SECURITY CLASS. (of this report)
Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Restraint System
Macca mulatta, Rhesus Monkeys
Papio papio, Baboon

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The illustrations presented here are of a subhuman primate restraint system that is a novel method of limiting conscious animal movement during experiments. This system is especially useful during acceleration and maintains its structural integrity and usefulness after exposure to high acceleration on a centrifuge.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

009 850

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

79 06 07 005

SUMMARY

This system satisfies the multiple requirements necessary to properly accomplish acceleration stress experiments where conscious subhuman primates are used as subjects. Although developed primarily for dynamic experiments, the PRS serves well for short term static use.

Devices exposed to acceleration of the magnitude generated by the Dynamic Environment Simulator (DES) generally require stringent measures to contend with the rigors of dynamic stresses. However, by using this system many high G experiments have been accomplished; many other experiments can be done that would require lesser physical demands.

Due to the versatility many of the PRS diverse applications are readily achieved. Some specific examples of this system's versatility are use of different animal species, variability of animal size and body shape, dynamic and static use, a safe condition for investigators when the animal is conscious, but restrained to avoid injury, emphasis on a minimum restraint area allowing a large area of animal exposure for instrumentation of the animal. Uses other than those applications mentioned above can be made of the PRS as it is presented and illustrated in the Materials Section of this report.

The present PRS has been in use on the centrifuge in support of specific experiments in excess of 100 acceleration exposures and continues to function as required. Considering the repeated use of this system the initial cost and maintenance fees seem minimal. A larger version of this same chair is under consideration to satisfy experiments that will require very large animals in the 60-90 lb range.

PREFACE

This report was prepared by the Simulation Support Branch, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio 45433.

The authors gratefully acknowledge Katherine C. Smith, Kevin J. Greenlees and Twyla J. Robinson for their assistance in preparing this report and Patricia M. Lewandowski for assistance in the final arrangement and preparation of this report.

Table of Contents

List of Figures

INTRODUCTION

The necessity to fabricate this Primate Restraint System (PRS) originated from a series of dynamic experiments whereby conscious subhuman primate subjects were exposed to acceleration stress. Several other restraint systems have been developed (1,2,3). The large size (10-40 lb) conscious animals used to satisfy our experimental design prevented the use of these other restraint systems. Conscious subhuman primates can become vicious, aggressive and difficult to manage. This is dangerous to the investigators and animal handlers when conventional restraints are used. Using the PRS illustrated here, (Fig. 1) the restrained animals do not remain excited or apprehensive, but become calm during the experiments, reducing the changes to compromise the data. This affords greater safety for the investigators and protects the animal from harm or injury, yielding valid experimental results and maximum data usage. This PRS (Fig. 2) was exposed to high acceleration (25G) using AMRL's Dynamic Environment Simulator (DES) with favorable results at all G levels.

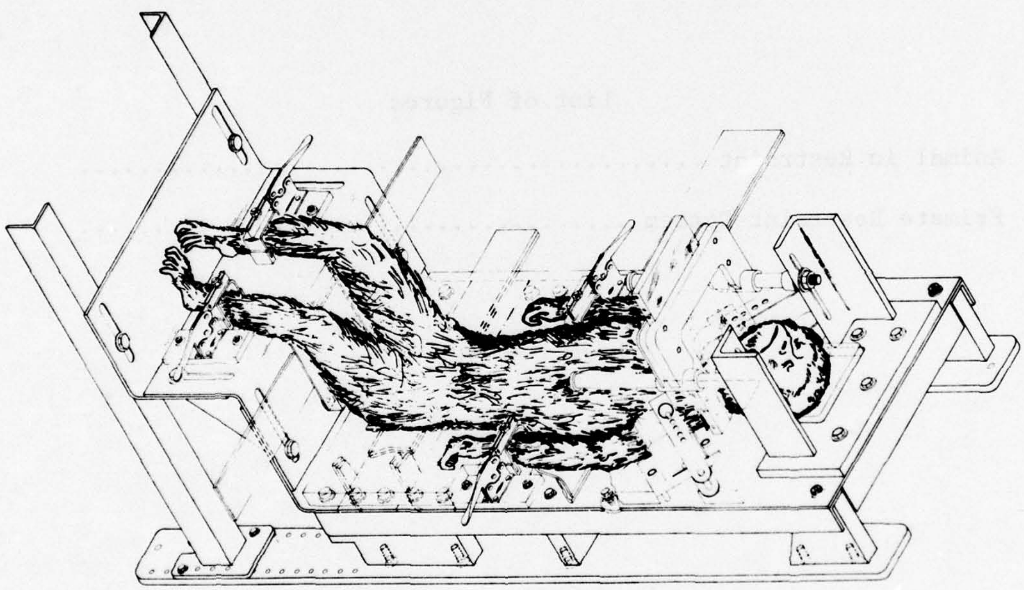


FIGURE 1. Animal In Restraint

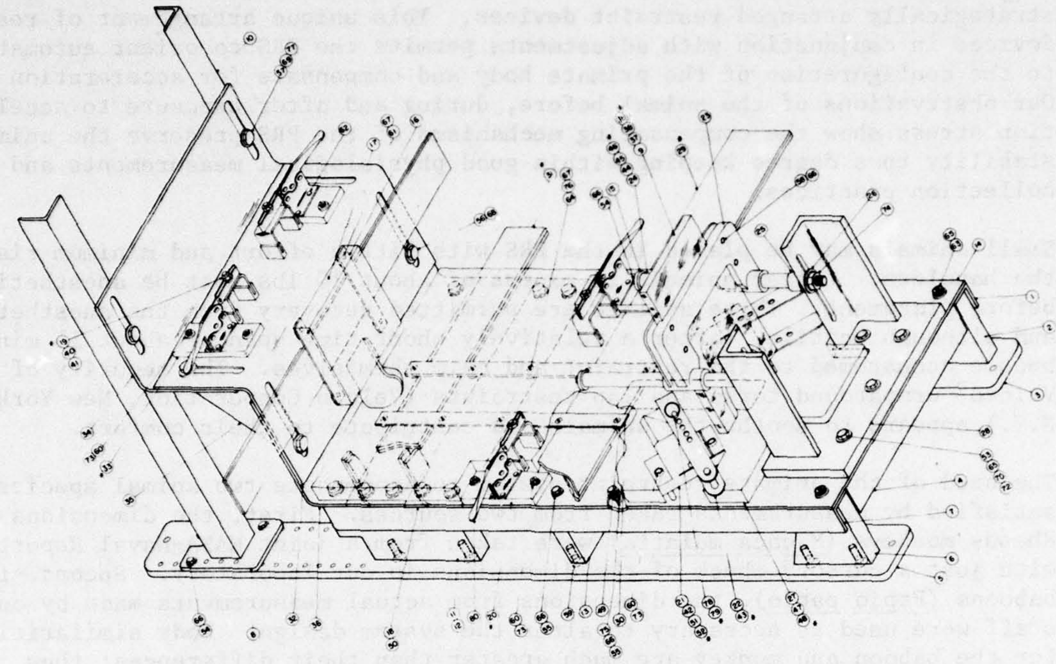


FIGURE 2. Primate Restraint System

OBJECTIVES

The basic objective of this system is to maintain, as much as possible, stable and practical conditions that contribute to a physiological norm for primates exposed to acceleration stress. There are some considerations within this basic objective that contribute to acceptable physiological conditions. The system must permit the use of conscious animals in a manner that is safe for the investigators and prevents undue harm to the animals. The system should accommodate a range of animals between 10-40 lb, and withstand high acceleration without any structural damage. Restraints should be arranged so simple that work in conjunction with each other should have maximal holding power, but cover just a small part of the body to permit easy access to the animal. Leads from physiological monitoring instruments must be accessible to the investigator, but out of the animal's reach. A small amount of removable absorbable material is preferred to contribute to an easily cleaned, sanitary system. Boney prominances should be protected and the contour of the primate body under G maintained to enhance animal comfort. A highly desirable feature would be a head-neck restraint that also prevents stragulation during acceleration stress.

RESULTS

Satisfactory solution of the objectives was achieved through the development of a system with multiple adjustments. The system was made more versatile by strategically arranged restraint devices. This unique arrangement of restraint devices in conjunction with adjustments permits the PRS to orient automatically to the configuration of the primate body and compensate for acceleration stress. Our observations of the animal before, during and after exposure to acceleration stress show the compensating mechanisms of the PRS preserve the animal's stability to a degree keeping within good physiological measurements and data collection practices.

Small animals may be placed in the PRS with little effort and minimum risk to the handlers. Larger animals in excess of about 10 lbs must be anesthetized before placement. These animals are permitted recovery from the anesthetic and although hostile, (after a relatively short time span of about 15 minutes), become accustomed to the restraint and calm themselves. The security of the Velcro^{R} wraparound torso and lap restraints (Velcro Corporation, New York, N.Y.) appears to soothe the animals and contribute to their comfort.

The need of the primate restraint system to accomodate two animal species was satisfied by measurements taken from two sources. First, the dimensions of Rhesus monkeys (*Macaca mulatta*) were taken from a joint NASA-Naval Report (4) with just a cursory check of the dimensions in our laboratory. Second, for baboons (*Papio papio*), the dimensions from actual measurements made by our staff were used as necessary to alter the system design. Body similarities for the baboon and monkey are much greater than their differences; thus, minor changes will permit use of the PRS for either species.

Figures and illustrations contained herein are adequate to derive all component functions of the system including some that may be necessary to satisfy experimental designs different from ours. Certain areas of the system will be expanded upon to show the intent of the total system. The materials used to fabricate this system are either physically strong enough to withstand the high gravitational forces generated by the 20 ft. radius centrifuge, or their arrangement in the system is such that up to 25 G can be withstood by this system without any structural damage.

The total restraint requires a series of lesser restraint devices that, of necessity, work in conjunction with each other to obtain maximum holding power. Restraint of 3 main body areas is sufficient to prevent escape and permit many large areas of the animal to be exposed for placement of instrumentation sensing detectors. The lower extremities are kept in place by over-the-center U clamps with an assist by a lap wraparound of Velcro on a nylon belt. The upper extremeties also use over-the-center U clamps, but the assist device to prevent the extraction of the lower arm or wrist from the U clamp is a special elbow restraint that swivels during animal movement or acceleration. The self compensating head-neck restraint is the most important part of the entire system. It restrains in a manner that permits exposure of animals to acceleration stress without strangulation or occulsion of major vessels to the head. Various sizes are available for either baboon or monkey and can be easily changed.

Those areas of the animals that are exposed to the PRS are padded with a small amount of reusable material that can be removed to sanitize the system between experimental animals.

The backplate of the system is adjustable to fit various animal sizes, and also allows ready access to leads from physiological monitoring instruments frequently used with this system. The hole in the backplate for these leads is out of the animals reach.

The system allows the animal to be properly restrained, with all four extremeties exposed, and the head, check and abdomen easily accessible for instrumentation. Essentially the same conditions are maintained, permitting data to be collected and reproduced if necessary and so enhance the validity of each experiment.

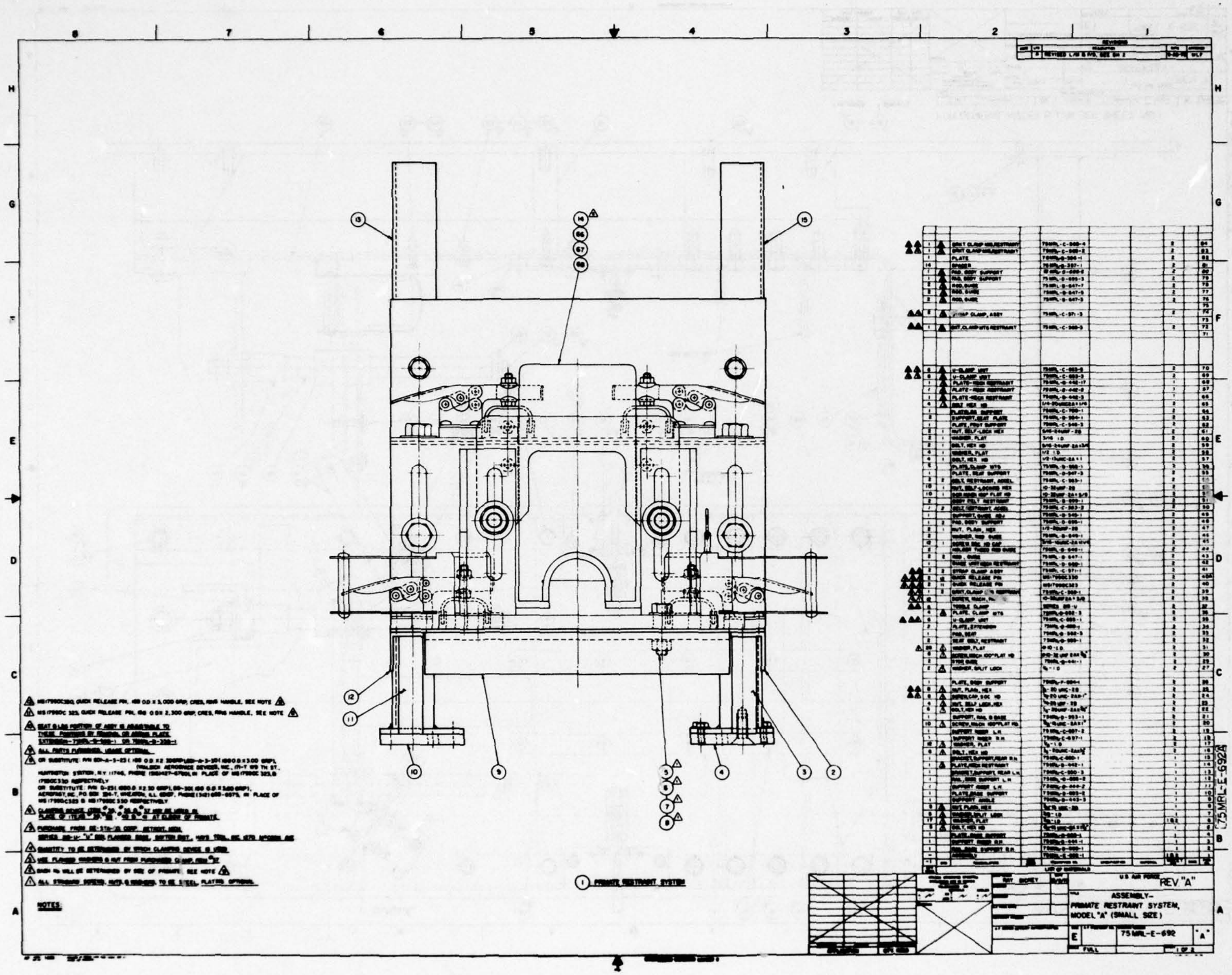
APPLICATIONS

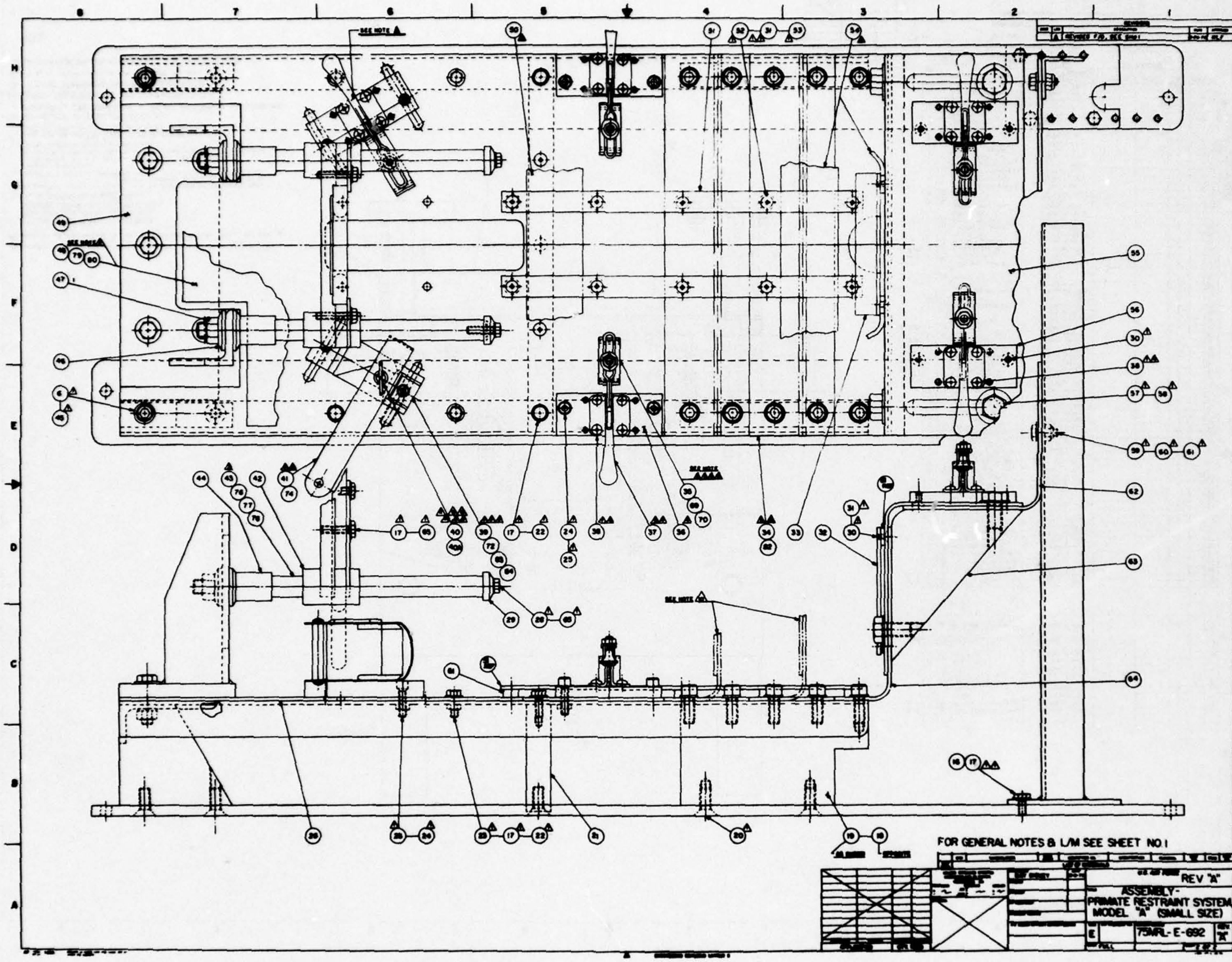
The primary application of this system is to provide a tool for the restraint of subhuman primates while under acceleration stress. The system also provides restraint and protection for an animal recovering from the anesthesia used in surgical procedures (6).

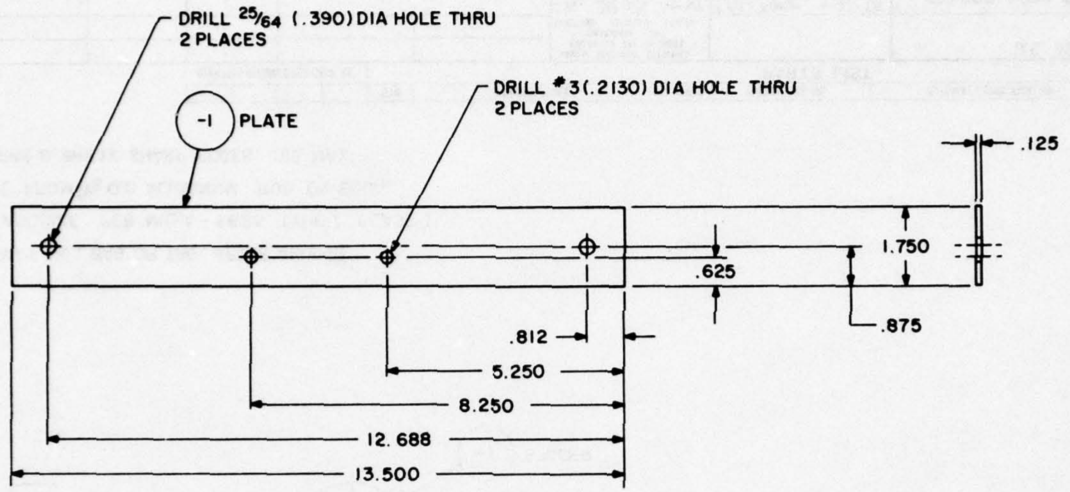
A unique feature of the Primate Restraint System is adaptability to a wide range of invasive investigative procedures. Wide exposure of body surface area combined with immobilization of the animal provides an excellent platform for the use of various tissue and vascular probes and catheters. Vascular injection of microspheres may be used to determine regional perfusion and cardiac output (5,6). Cardiac output may also be monitored using thermal (6) and dye dilution techniques, or vascular flow probes. Standard transducers may be used to measure blood pressure (6). Tissue probes may be used to measure pH, or oxygen tension, including cerebral oxygen.

These are just a sample of the applications opened with the use of the PRS. These procedures have been successfully tested on the PRS where indicated by the reference citations. Modifications of these procedures, or the restraint system itself, limits application of this system to the imagination of the investigator.

MATERIALS


PRIMATE RESTRAINT SYSTEM
NOTES:
LIST OF MATERIALS
U.S. AIR FORCE
REV "A"
ASSEMBLY-
PRIMATE RESTRAINT SYSTEM,
MODEL "A" (SMALL SIZE)
E
75MRL-E-692
"A"
FULL
1 OF 2
75MRL-E-692A


SEE NOTE
FOR GENERAL NOTES & L/M SEE SHEET NO.1
REV "A"
ASSEMBLY-
PRIMATE RESTRAINT SYSTEM
MODEL "A" (SMALL SIZE)
75MRL-E-692



3. IDENTIFY WITH PART NO., USE WATER-PROOF INK OR PAINT, AFTER ANODIZE.

2. FINISH: CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.

1. REMOVE ALL BURRS & BREAK SHARP EDGES, .015 MAX

NOTE:

QTY REQD PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY	FINAL ASSY
-1	76MRL-E-692-1	1	1

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/32 DECIMALS .XX ±.031 .XXX ±.015 ANGLES ±0°-30'

MATERIAL: 6061-T6 ALUM. OR EQ

FINISH: SEE NOTE 2

DR BILL FINCH 9-27-76

U.S. AIR FORCE

TITLE: PLATE-EXTENSION, 1.750 WIDE PRIMATE RESTRAINT SYSTEM

SIZE: B

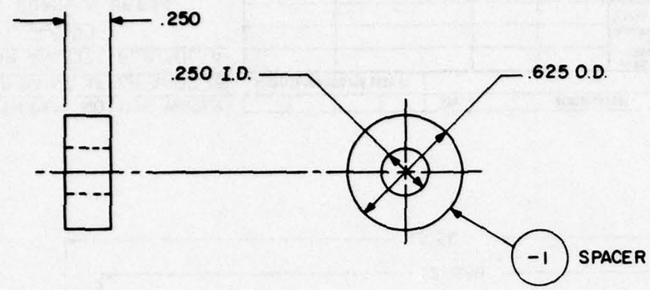
DRAWING NO. 76MRL-B-356

SCALE 1/2 SHEET 1 OF 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B

LTR	DESCRIPTION	DATE	APPROVED
A	QUANITY FOR 75MRL-E-543-1 "WAS" 12 FOR NEXT ASSY, 12 FOR FINAL ASSY	12-16-76	



4. IDENTIFY WITH PART NO., BAG OR TAG, AFTER ANODIZE
3. FINISH : CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
2. MATERIAL : MAKE FROM 5/8 O.D. ALUMINUM ROD OR EQUAL.
1. REMOVE ALL BURRS & BREAK SHARP EDGES, .015 MAX.

NOTE :

PARTS LIST

QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

DASH NO.	NEXT ASSY	FINAL ASSY	CONTRACTOR CODE IDENT NO.	NEXT ASSEMBLY	USED ON
-1	16	16		75MRL-E-543-1	~
-1	14	14		75MRL-E-692-1	~
	QUANTITY REQUIRED			APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/32 DECIMALS .XX ±.031 .XXX ±.015 ANGLES ±0°30'

MATERIAL : SEE NOTE 2

FINISH : SEE NOTE 3

DR BILL FINCH 9-27-76

U.S. AIR FORCE

REV. "A"

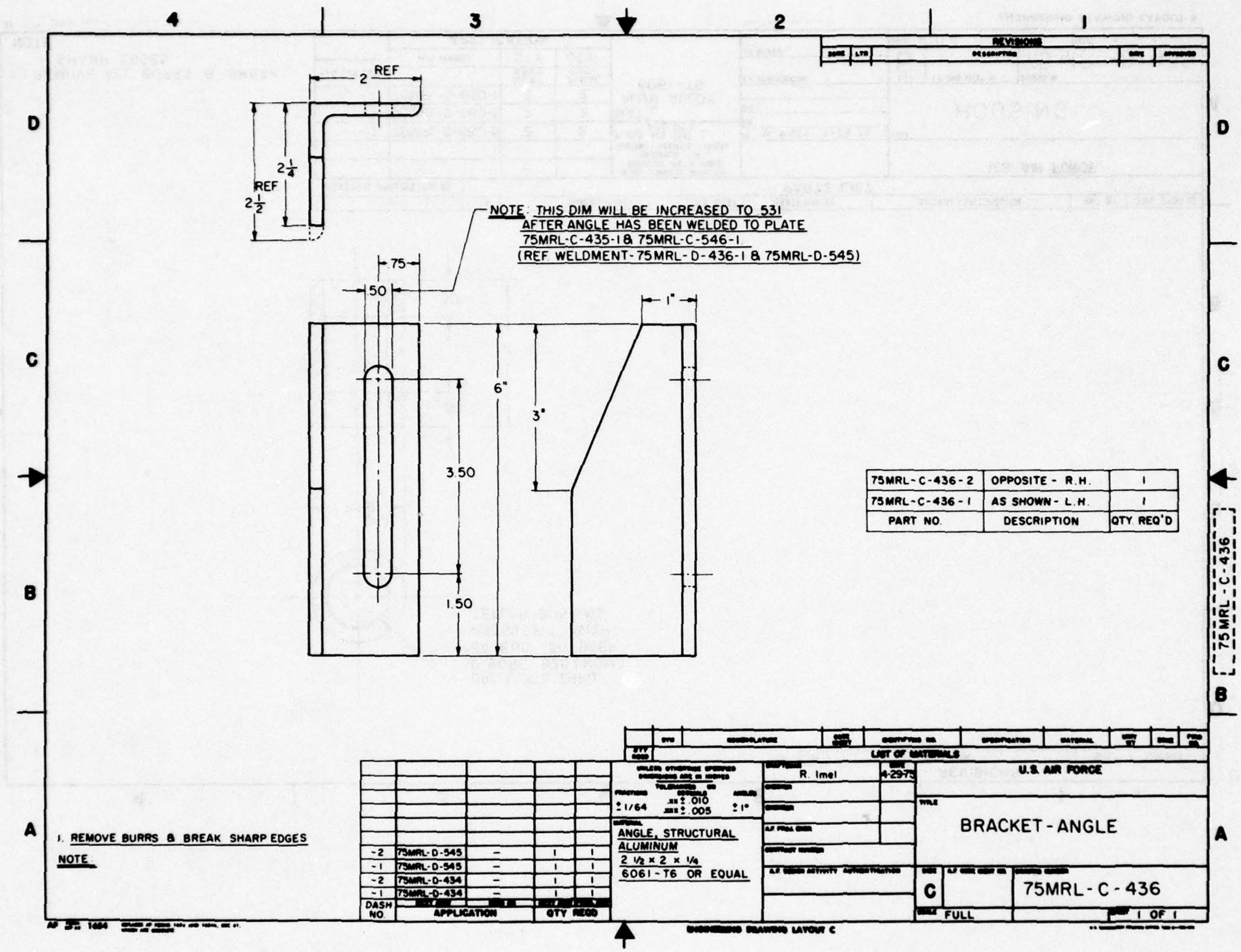
TITLE SPACER-BODY RESTRAINT BELT, PRIMATE RESTRAINT SYSTEM

SIZE B DRAWING NO. 76MRL-B-357

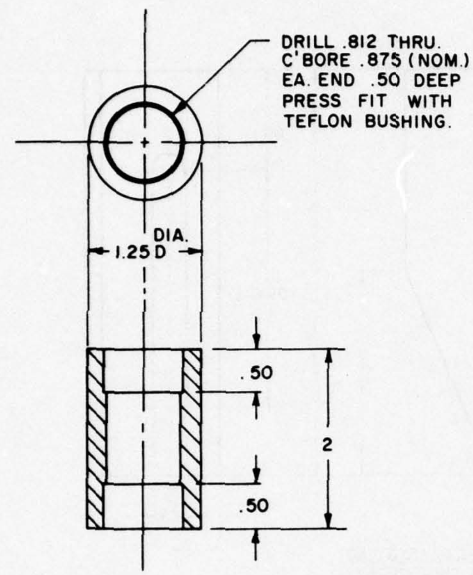
SCALE 2/1 SHEET 1 OF 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED. GPO 1972 O - 473-900

ENGINEERING DRAWING LAYOUT B



REF
2
REF
$2\frac{1}{2}$
$2\frac{1}{4}$
NOTE: THIS DIM WILL BE INCREASED TO .531
AFTER ANGLE HAS BEEN WELDED TO PLATE
75MRL-C-435-1 & 75MRL-C-546-1
(REF WELDMENT-75MRL-D-436-1 & 75MRL-D-545)
.75
.50
1"
6"
3"
3.50
1.50
75MRL-C-436-2 OPPOSITE - R.H. 1
75MRL-C-436-1 AS SHOWN - L.H. 1
PART NO. DESCRIPTION QTY REQ'D
75MRL-C-436
REVISIONS
1. REMOVE BURRS & BREAK SHARP EDGES
NOTE
-2 75MRL-D-545 1 1
-1 75MRL-D-545 1 1
-2 75MRL-D-434 1 1
-1 75MRL-D-434 1 1
DASH NO.
APPLICATION
QTY REQD
LIST OF MATERIALS
±1/64 .xx ± .010 .xxx ± .005 ±1°
ANGLE, STRUCTURAL
ALUMINUM
2 1/2 × 2 × 1/4
6061-T6 OR EQUAL
R. Imel
4-29-75
U.S. AIR FORCE
BRACKET-ANGLE
C
75MRL-C-436
FULL
1 OF 1
ENGINEERING DRAWING LAYOUT C



REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

NOTE :
1.1 REMOVE ALL BURRS & BREAK SHARP EDGES.

PARTS LIST

DASH NO	NEXT ASSY	NEXT ASSY QTY	FINAL ASSY QTY
-1	75MRL-D-660-5	2	2
-1	75MRL-D-660-3	2	2
-1	75MRL-D-660-1	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±.015, DECIMALS .XX ±.010, .XXX ±.005, ANGLES ±

MAT'L
ALUM ALLOY
6061-T6

DR M. RILEY 4-29-75

U.S. AIR FORCE

TITLE: HOUSING

SIZE: B

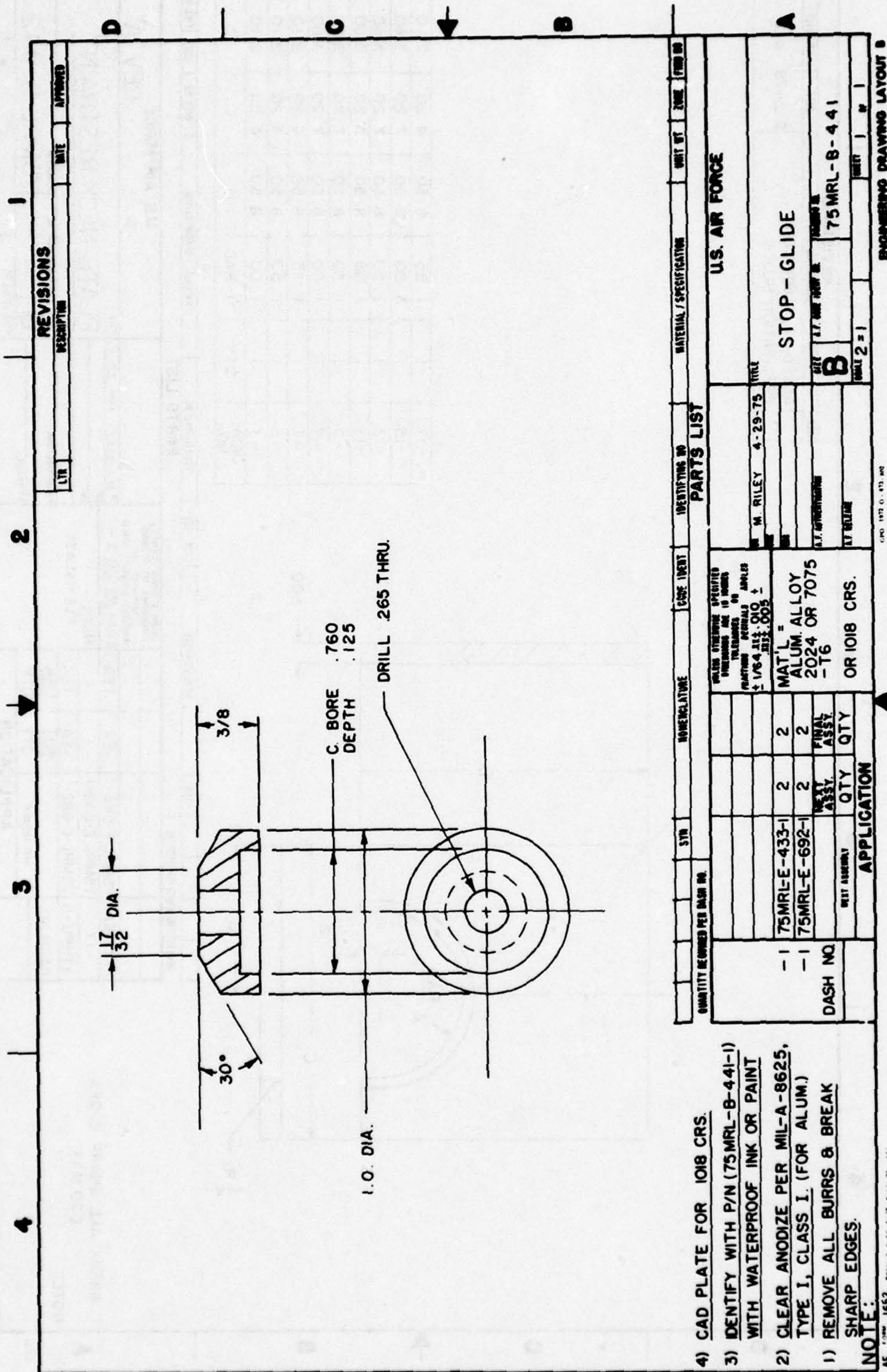
DRAWING NO.: 75 MRL-B-439

SCALE: FULL

SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

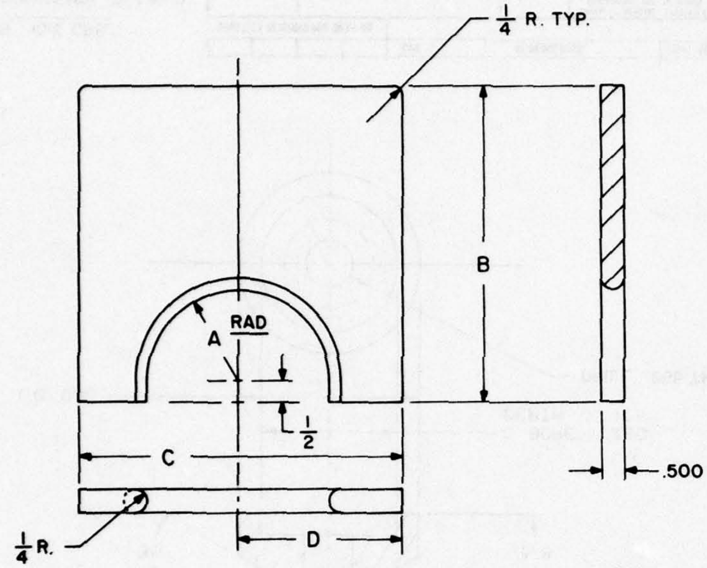
ENGINEERING DRAWING LAYOUT B



REVISIONS
LTR DESCRIPTION DATE APPROVED
17/32 DIA.
30°
I.O. DIA.
3/8
C. BORE .760
DEPTH .125
DRILL .265 THRU.
-1 75MRL-E-433-1 2 2
-1 75MRL-E-692-1 2 2
DASH NO. NEXT ASSY. QTY FINAL ASSY. QTY
APPLICATION
PARTS LIST
MAT'L = ALUM. ALLOY 2024 OR 7075 -T6 OR 1018 CRS.
M. RILEY 4-29-75
U.S. AIR FORCE
STOP - GLIDE
B 75MRL-B-441
SCALE 2=1 SHEET 1 OF 1
ENGINEERING DRAWING LAYOUT B
NOTE:
1) REMOVE ALL BURRS & BREAK SHARP EDGES.
2) CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I. (FOR ALUM.)
3) IDENTIFY WITH P/N (75MRL-B-441-1) WITH WATERPROOF INK OR PAINT
4) CAD PLATE FOR 1018 CRS.

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	ADDED -17, CORRECTED APPLICATION BLOCK	9-24-76	WLF



DASH NO.	QTY	A RAD	B	C	D
-17	1	1.25	8.50	4.20	2.10
-15	1	3.00	8.50	7.20	3.60
-13	1	2.50	8.50	7.20	3.60
-11	1	2.00	8.50	7.20	3.60
-9	1	1.50	8.50	7.20	3.60
-7	1	1.00	8.50	7.20	3.60
-5	1	1.75	8.50	4.20	2.10
-3	1	1.50	8.50	4.20	2.10
-1	1	1.00	8.50	4.20	2.10

QUANTITY REQUIRED PER DASH NO. | SYM | NOMENCLATURE | CODE IDENT | IDENTIFYING NO | MATERIAL / SPECIFICATION | UNIT WT | ZONE | FIND NO

PARTS LIST

NOTE:
1. BREAK ALL SHARP EDGES .020 MAX

APPLICATION

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-7 THRU-15	75MRL-E-543-1	1EA	1EA
-17	75MRL-E-692-1	1	1
-1 THRU-5	75MRL-E-692-1	1EA	1EA

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS .XX ±.010 .XXX ±.005 ANGLES ± ~

MAT'L PLEXIGLASS

DR M. RIELEY APR. 30

U.S. AIR FORCE

REV. "A"

TITLE PLATE, NECK RESTRAINT

SIZE B | DRAWING NO. 75MRL-B-442

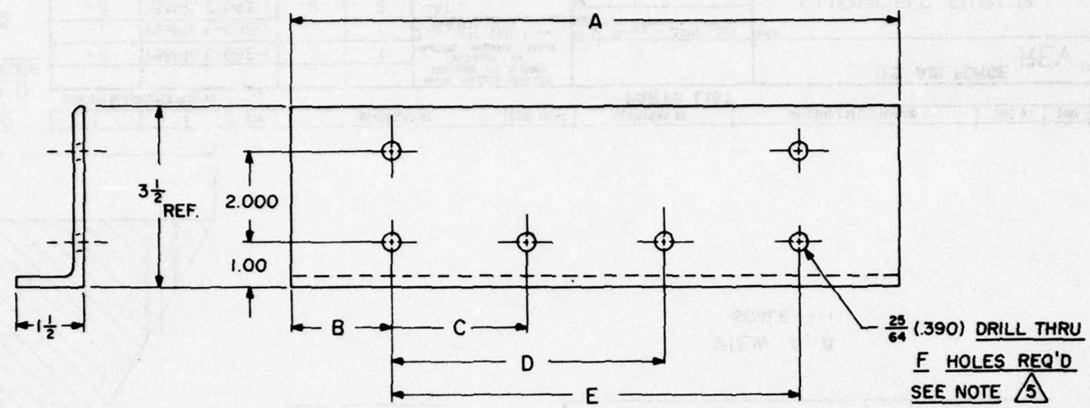
SCALE HALF | SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

GPO 1972 O - 473-

ENGINEERING DRAWING LAYOUT B

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	ADDED NOTE 5 ADDED NEXT ASSY	9-16-76	WLF



-3	10 15/16	2.47	3.000	NOT USED	6.000	5
-1	13 7/16	2.22	3.000	6.000	9.000	6
DASH NO.	A	B	C	D	E	F

5 FOR-1, HOLES MUST MATCH HOLES IN 75 MRL-E-544-1
FOR-3, HOLES MUST MATCH HOLES IN 75 MRL-D-694-1

4. IDENTIFY WITH P/N (75 MRL-B-443-1, OR -3) WITH WATERPROOF INK OR PAINT.

3. CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.

2. REMOVE ALL BURRS & BREAK SHARP EDGES.

1. MAT'L: ANGLE, STRUCTURAL ALUM. 3 1/2 × 2 1/2 × 1/2 6061-T6 OR EQUAL

NOTE:

QTY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-3	75MRL-E-692-1	1	1
-1	75MRL-E-543-1	1	1

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
± 1/64 .XX ± .010 .XXX ± .005 ± ~

MAT'L: SEE NOTE #1

FINISH. SEE NOTE #2

DR R. Imel 4-30-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

REV. "A"

TITLE SUPPORT - ANGLE

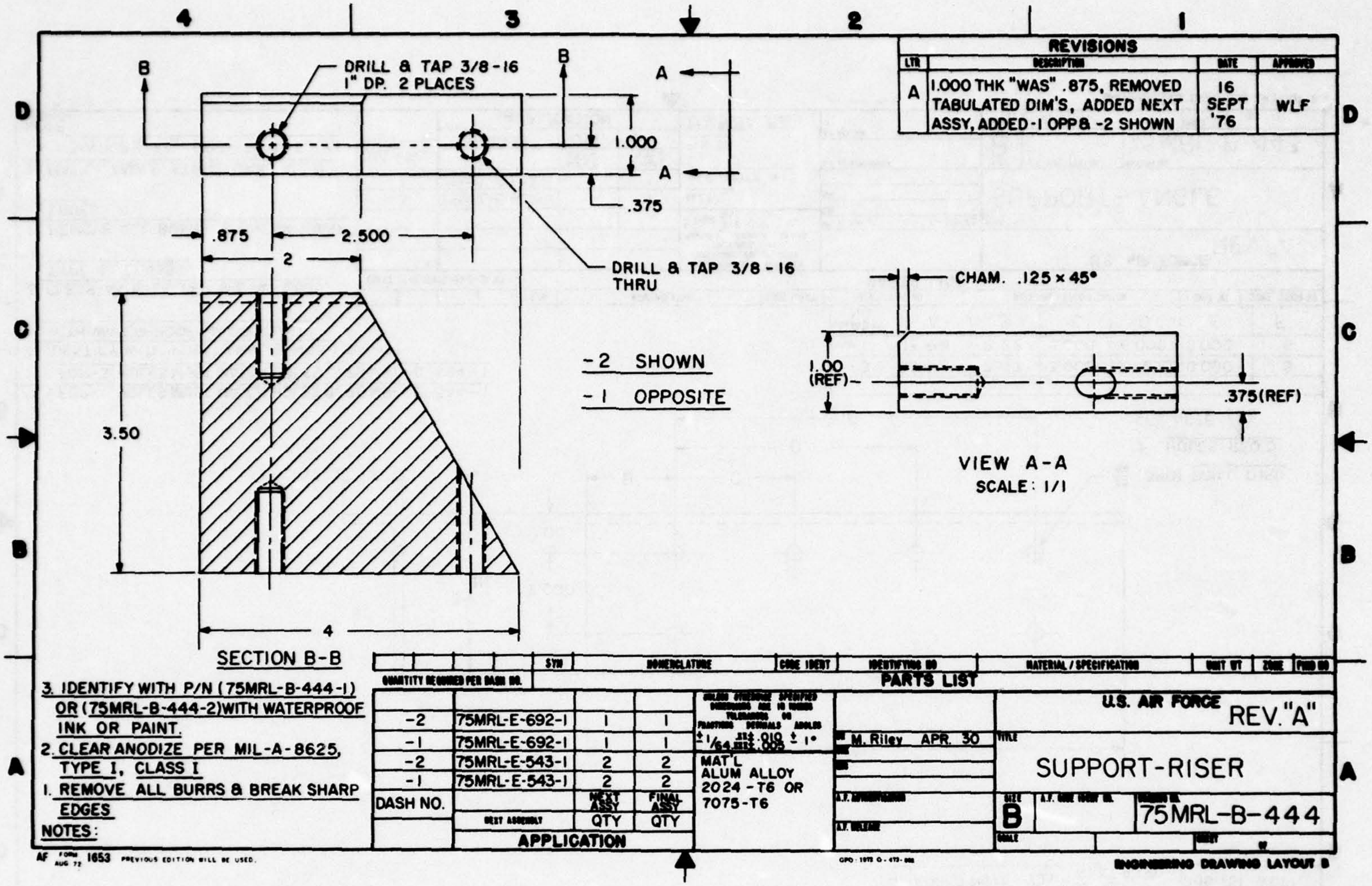
SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-443

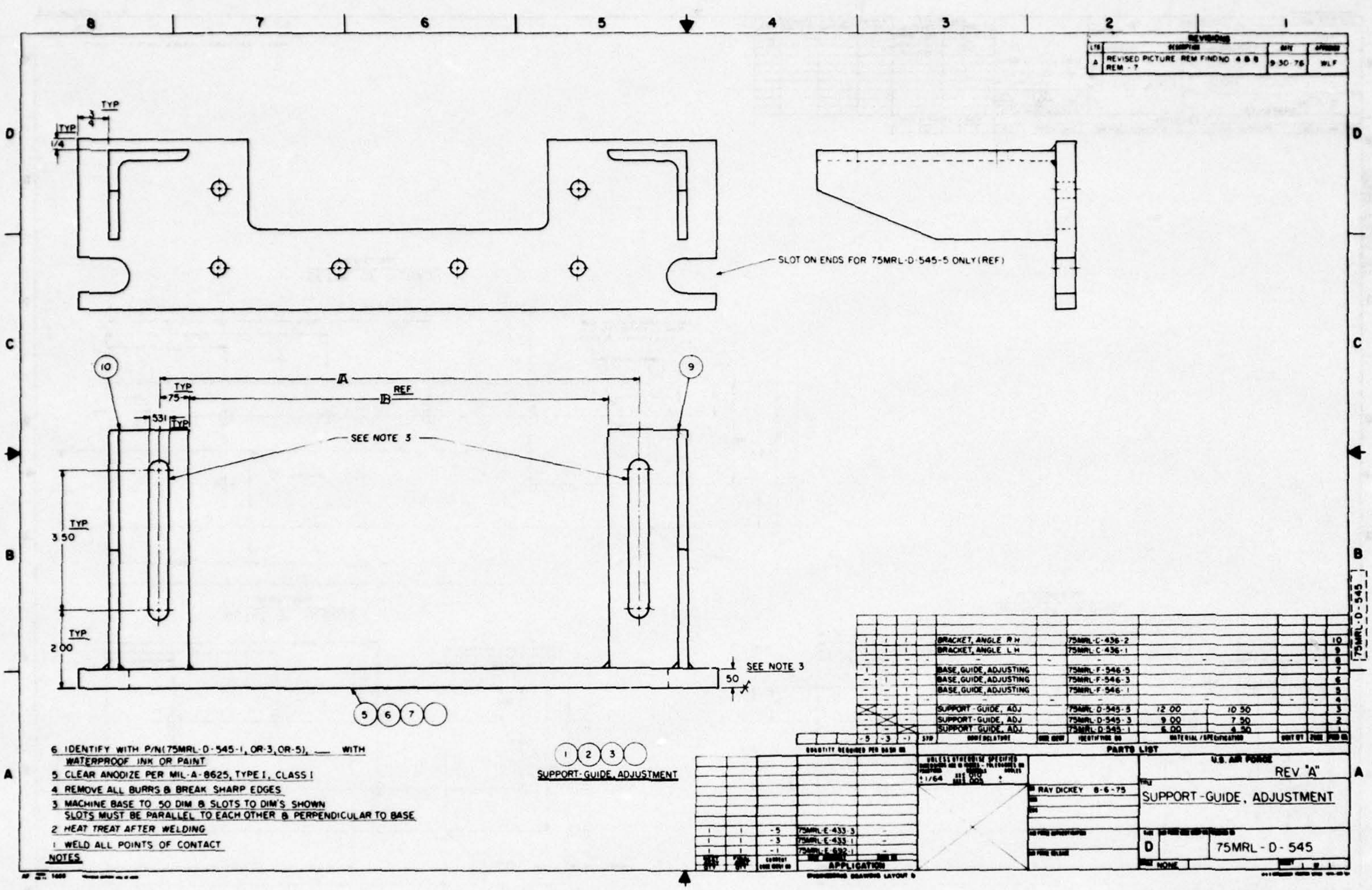
SCALE 1/2" = 1" | SHEET 1 OF 1

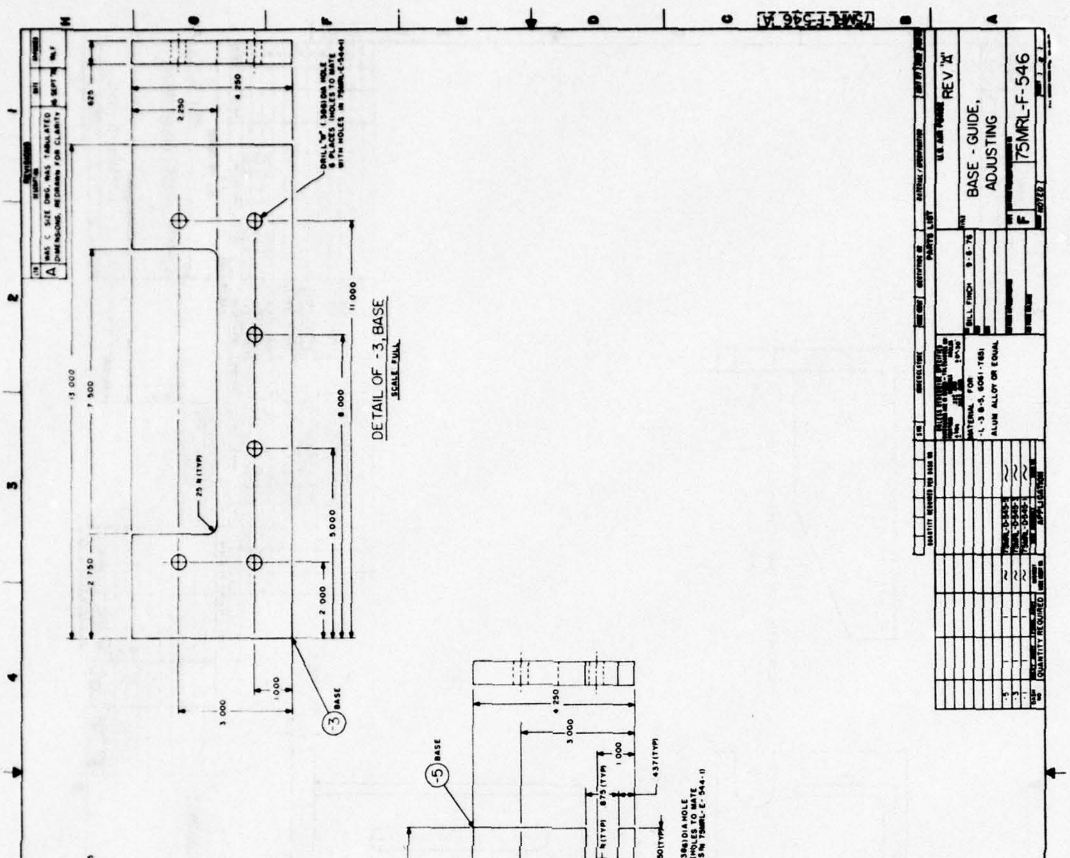
AF FORM AUG 72 1653 PREVIOUS EDITION WILL BE USED.

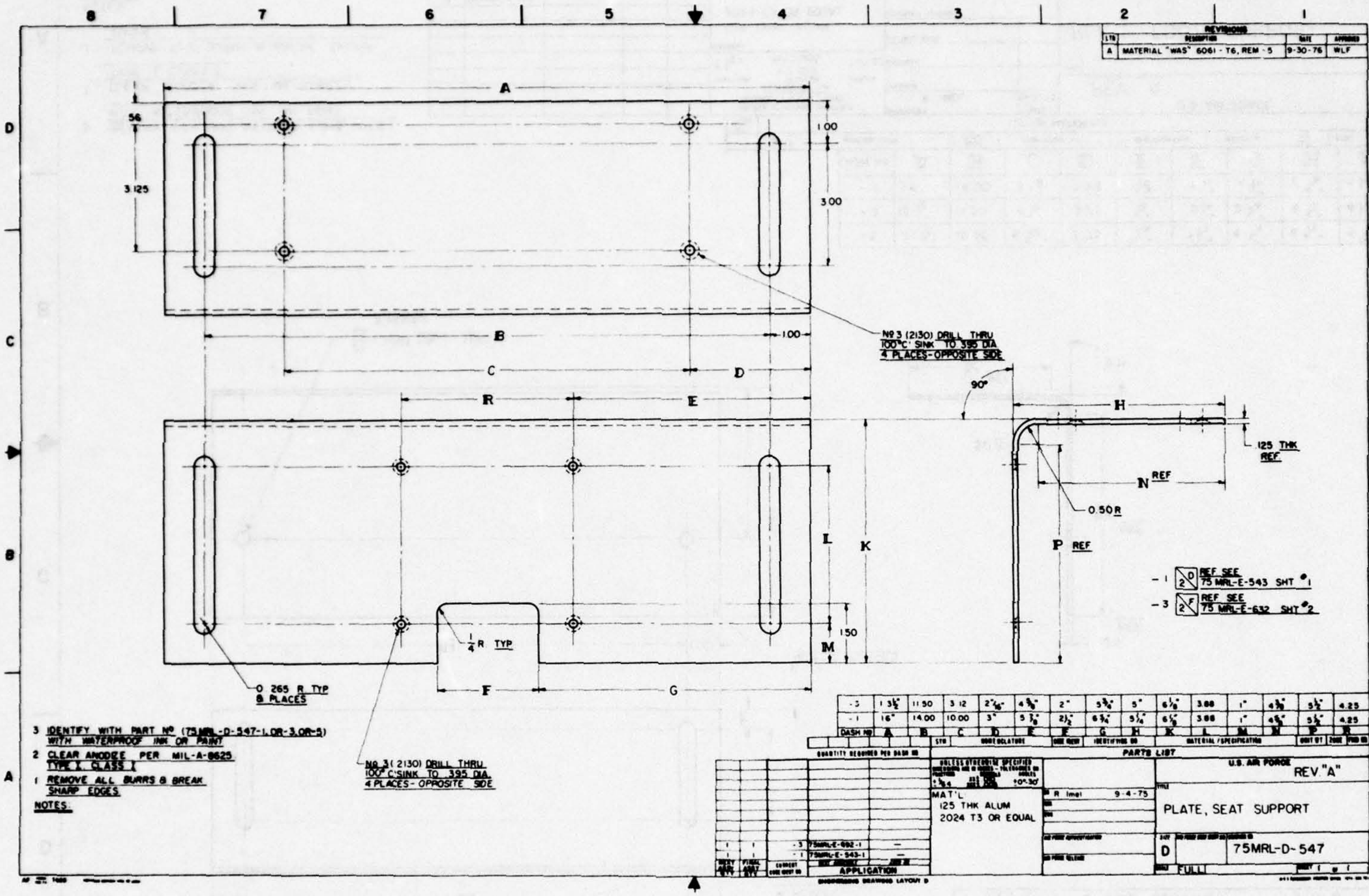
GPO 1973 O - 473-902

ENGINEERING DRAWING LAYOUT B


REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
A
1.000 THK "WAS" .875, REMOVED TABULATED DIM'S, ADDED NEXT ASSY, ADDED -1 OPP & -2 SHOWN
16 SEPT '76
WLF
DRILL & TAP 3/8-16 1" DP. 2 PLACES
DRILL & TAP 3/8 - 16 THRU
1.000
.375
.875
2.500
2
3.50
4
SECTION B-B
-2 SHOWN
-1 OPPOSITE
CHAM. .125 x 45°
1.00 (REF)
.375(REF)
VIEW A-A
SCALE: 1/1
3. IDENTIFY WITH P/N (75MRL-B-444-1) OR (75MRL-B-444-2) WITH WATERPROOF INK OR PAINT.
2. CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
1. REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
PARTS LIST
-2 75MRL-E-692-1 1 1
-1 75MRL-E-692-1 1 1
-2 75MRL-E-543-1 2 2
-1 75MRL-E-543-1 2 2
DASH NO.
NEXT ASSY
FINAL ASSY
QTY
QTY
APPLICATION
MAT'L
ALUM ALLOY
2024-T6 OR
7075-T6
M. Riley APR. 30
U.S. AIR FORCE
REV."A"
SUPPORT-RISER
B
75MRL-B-444
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.
ENGINEERING DRAWING LAYOUT B

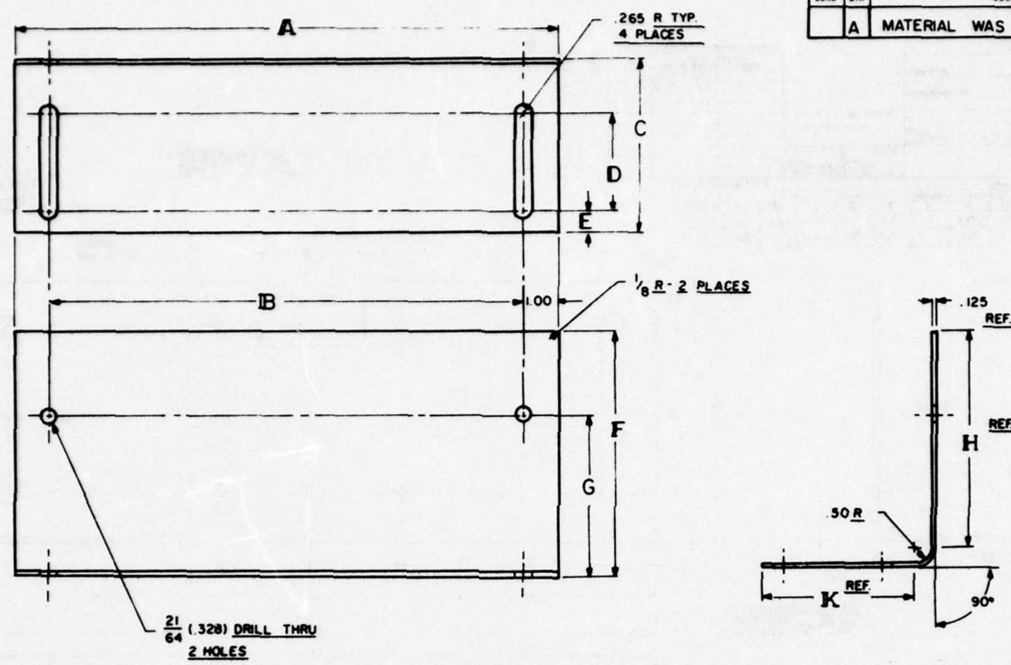

SLOT ON ENDS FOR 75MRL-D-545-5 ONLY (REF)
SEE NOTE 3
REF
TYP
3.50
2.00
.50
.75
.531
6 IDENTIFY WITH P/N (75MRL-D-545-1, OR-3, OR-5), ___ WITH WATERPROOF INK OR PAINT
5 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
4 REMOVE ALL BURRS & BREAK SHARP EDGES
3 MACHINE BASE TO .50 DIM & SLOTS TO DIM'S SHOWN SLOTS MUST BE PARALLEL TO EACH OTHER & PERPENDICULAR TO BASE
2 HEAT TREAT AFTER WELDING
1 WELD ALL POINTS OF CONTACT
NOTES
SUPPORT-GUIDE, ADJUSTMENT
REVISED PICTURE REM FINDNO 4 & 8 REM -7
9-30-76
BRACKET, ANGLE R.H. 75MRL-C-436-2
BRACKET, ANGLE L.H. 75MRL-C-436-1
BASE, GUIDE, ADJUSTING 75MRL-F-546-5
BASE, GUIDE, ADJUSTING 75MRL-F-546-3
BASE, GUIDE, ADJUSTING 75MRL-F-546-1
SUPPORT-GUIDE, ADJ 75MRL-D-545-5 12.00 10.50
SUPPORT-GUIDE, ADJ 75MRL-D-545-3 9.00 7.50
SUPPORT-GUIDE, ADJ 75MRL-D-545-1 6.00 4.50
PARTS LIST
APPLICATION
RAY DICKEY 8-6-75
U.S. AIR FORCE
REV "A"
SUPPORT-GUIDE, ADJUSTMENT
D
75MRL-D-545
NONE


DETAIL OF -1, BASE
SCALE FULL
DETAIL OF -3, BASE
SCALE FULL
DETAIL OF -5, BASE
SCALE FULL
NOTE
BASE - GUIDE, ADJUSTING
REV "A"
75MRL-F-546



REVISIONS
A MATERIAL "WAS" 6061-T6, REM -5 9-30-76 WLF
No 3 (2130) DRILL THRU 100° C'SINK TO .395 DIA 4 PLACES-OPPOSITE SIDE
90°
125 THK REF
N REF
0.50 R
P REF
-1 REF SEE 75 MRL-E-543 SHT #1
-3 REF SEE 75 MRL-E-632 SHT #2
1/4 R TYP
0 265 R TYP 8 PLACES
3 IDENTIFY WITH PART No (75MRL-D-547-1,OR-3,OR-5) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
PARTS LIST
U.S. AIR FORCE
REV "A"
MAT'L 125 THK ALUM 2024 T3 OR EQUAL
PLATE, SEAT SUPPORT
D
75MRL-D-547
FULL
APPLICATION

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	A	MATERIAL WAS 6061-T6	9-29-75	WLF



DASH NO.	A	B	C	D	E	F	G	H	K
-5	21 1/2"	19.50	6 9/16"	3.75	11/16"	7 1/4"	4 3/4	6 5/8"	5 13/16"
-3	13 1/2"	11.50	4 7/8"	3.25	3/8"	5 1/4"	2 3/4"	4 5/8"	4 1/4"
-1	16"	14.00	5 1/8"	2.88	5/8"	7 1/4	4 3/4"	6 5/8"	4 1/2"

LIST OF MATERIALS

NOTES:

3. IDENTIFY WITH PART NO.(75MRL-1, OR 3, OR 5.) WITH WATERPROOF INK OR PAINT
2. CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I
1. REMOVE ALL BURRS & BREAK SHARP EDGES

DASH NO.	APPLICATION		QTY REQD	
-5	75MRL-E-179	—	1	1
-3	75MRL-E-692	—	1	1
-1	75MRL-E-543	—		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS ± 1/64; DECIMALS .XX ± .010, .XXX ± .005; ANGLES ± 0°-30'

MATERIAL: .125 THK ALUM. 2024-T3 OR EQUAL

DRAFTSMAN: R. IMEL — DATE: 9-4-75

U.S. AIR FORCE

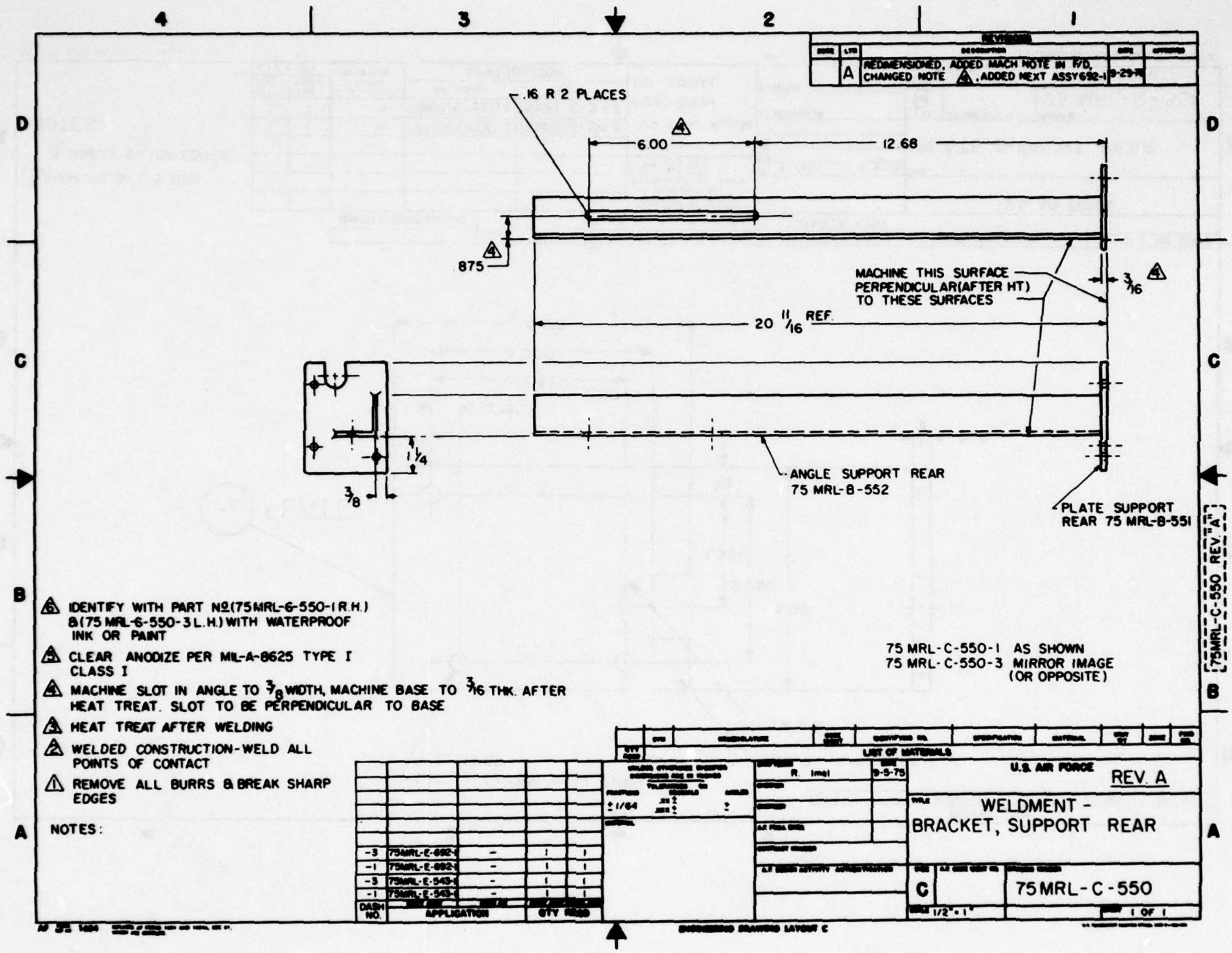
REV. A

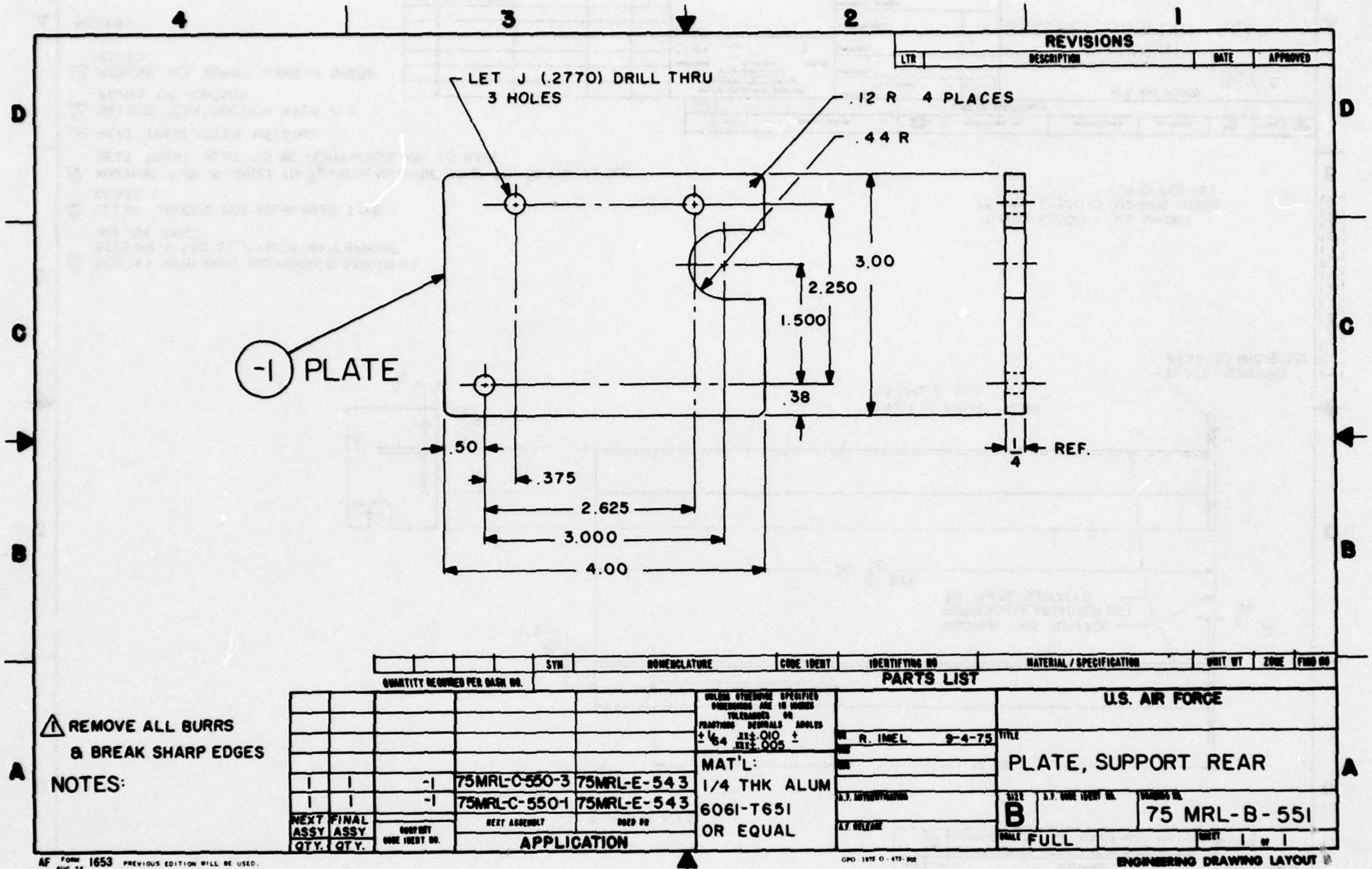
TITLE: PLATE FOOT SUPPORT

SIZE: C — DRAWING NUMBER: 75 MRL-C-548

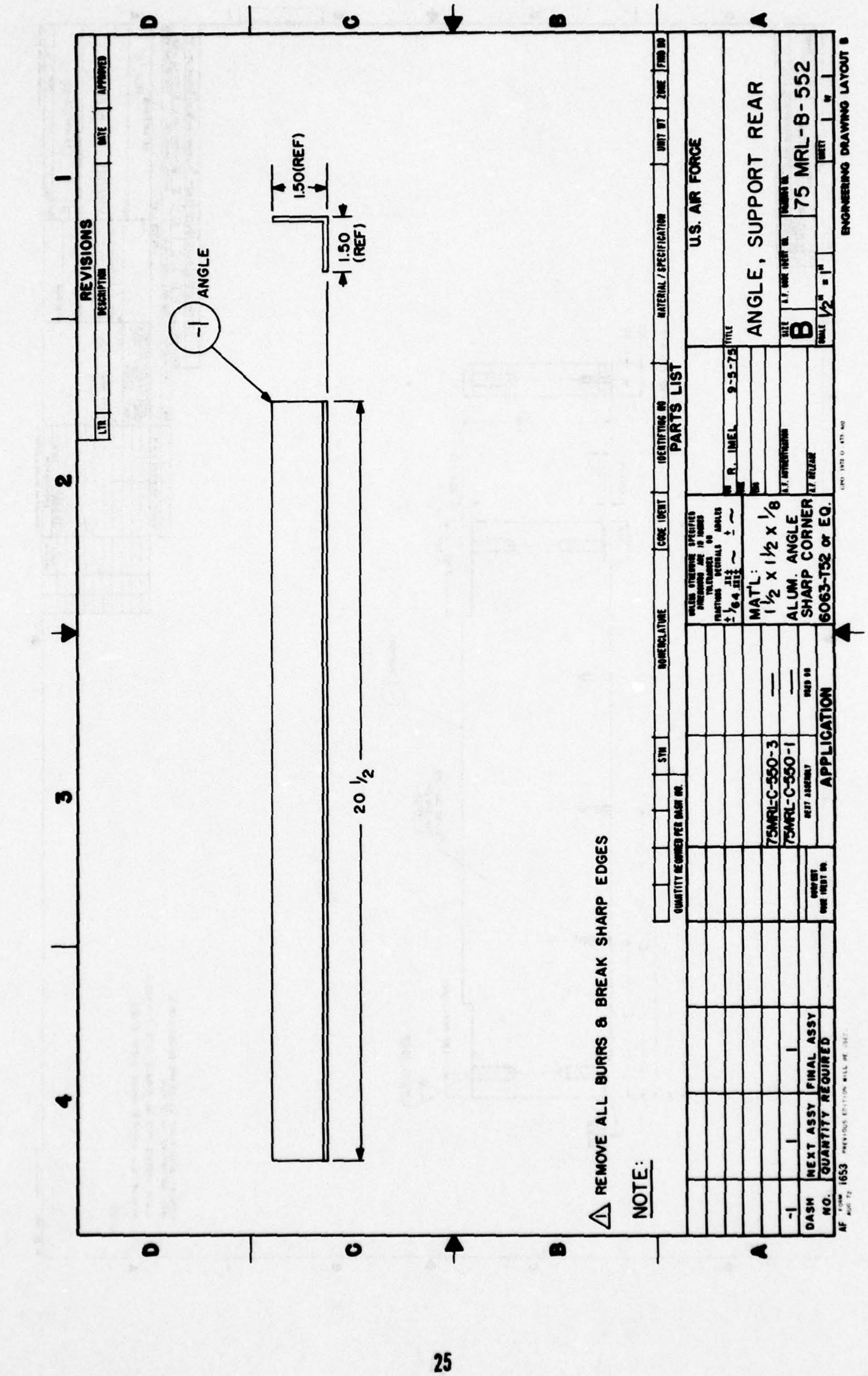
SCALE: 1/2" = 1" — SHEET 1 OF 1

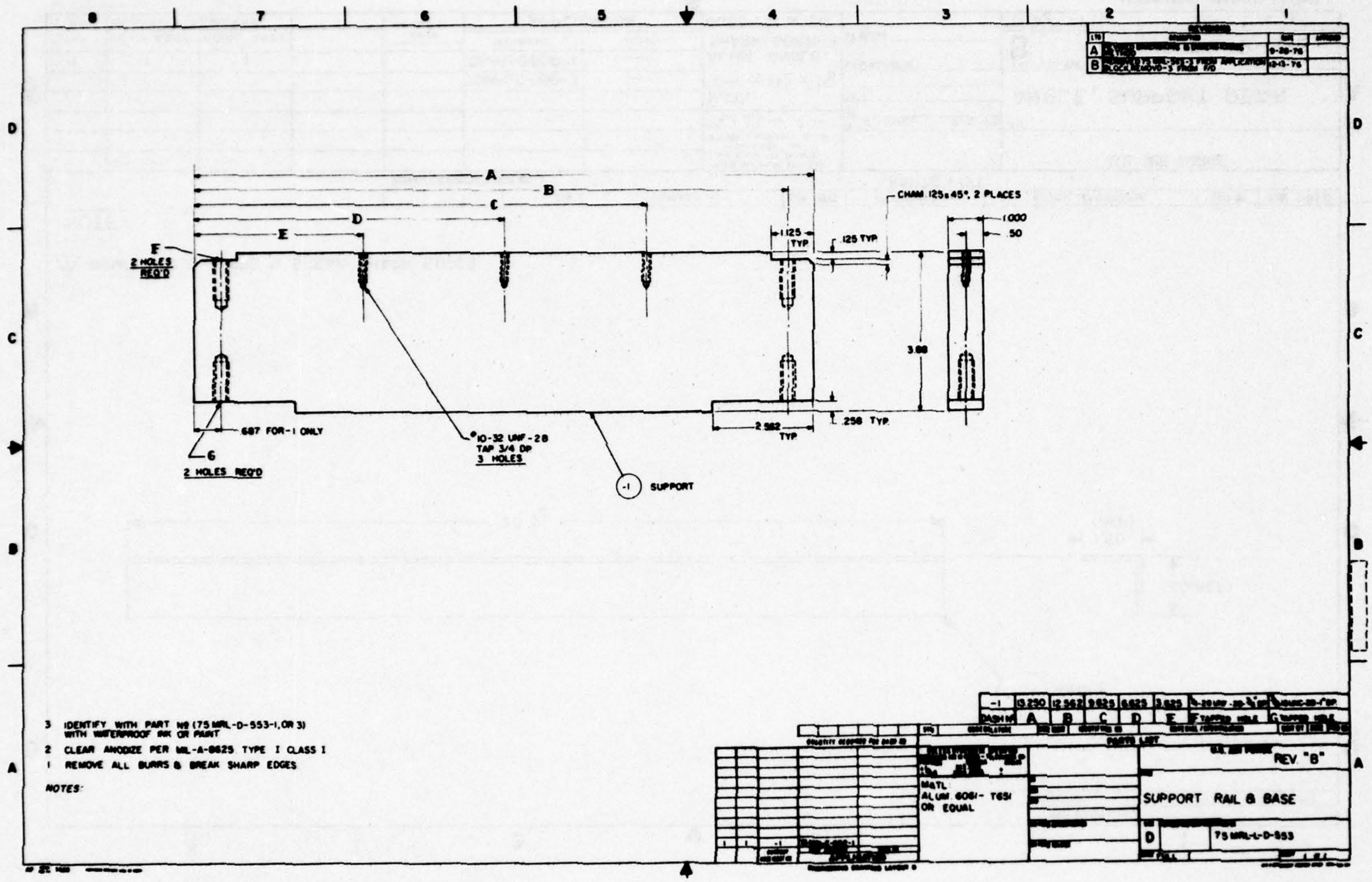
ENGINEERING DRAWING LAYOUT C


REVISIONS
A REDIMENSIONED, ADDED MACH NOTE IN F/D, CHANGED NOTE 4, ADDED NEXT ASSY 692-1 9-29-75
.16 R 2 PLACES
6.00
12.68
.875
MACHINE THIS SURFACE PERPENDICULAR (AFTER HT) TO THESE SURFACES
3/16
20 11/16 REF.
1 1/4
3/8
ANGLE SUPPORT REAR 75 MRL-B-552
PLATE SUPPORT REAR 75 MRL-B-551
75MRL-C-550 REV "A"
6 IDENTIFY WITH PART NO. (75MRL-6-550-1 R.H.) & (75 MRL-6-550-3 L.H.) WITH WATERPROOF INK OR PAINT
5 CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I
4 MACHINE SLOT IN ANGLE TO 3/8 WIDTH, MACHINE BASE TO 3/16 THK. AFTER HEAT TREAT. SLOT TO BE PERPENDICULAR TO BASE
3 HEAT TREAT AFTER WELDING
2 WELDED CONSTRUCTION-WELD ALL POINTS OF CONTACT
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
75 MRL-C-550-1 AS SHOWN
75 MRL-C-550-3 MIRROR IMAGE (OR OPPOSITE)
LIST OF MATERIALS
-3 75MRL-E-692-1
-1 75MRL-E-692-1
-3 75MRL-E-543-1
-1 75MRL-E-543-1
DASH NO.
APPLICATION
QTY REQD
± 1/64
R. Imel
9-5-75
U.S. AIR FORCE
REV. A
WELDMENT - BRACKET, SUPPORT REAR
C
75MRL-C-550
1/2" = 1"
1 OF 1
ENGINEERING DRAWING LAYOUT C

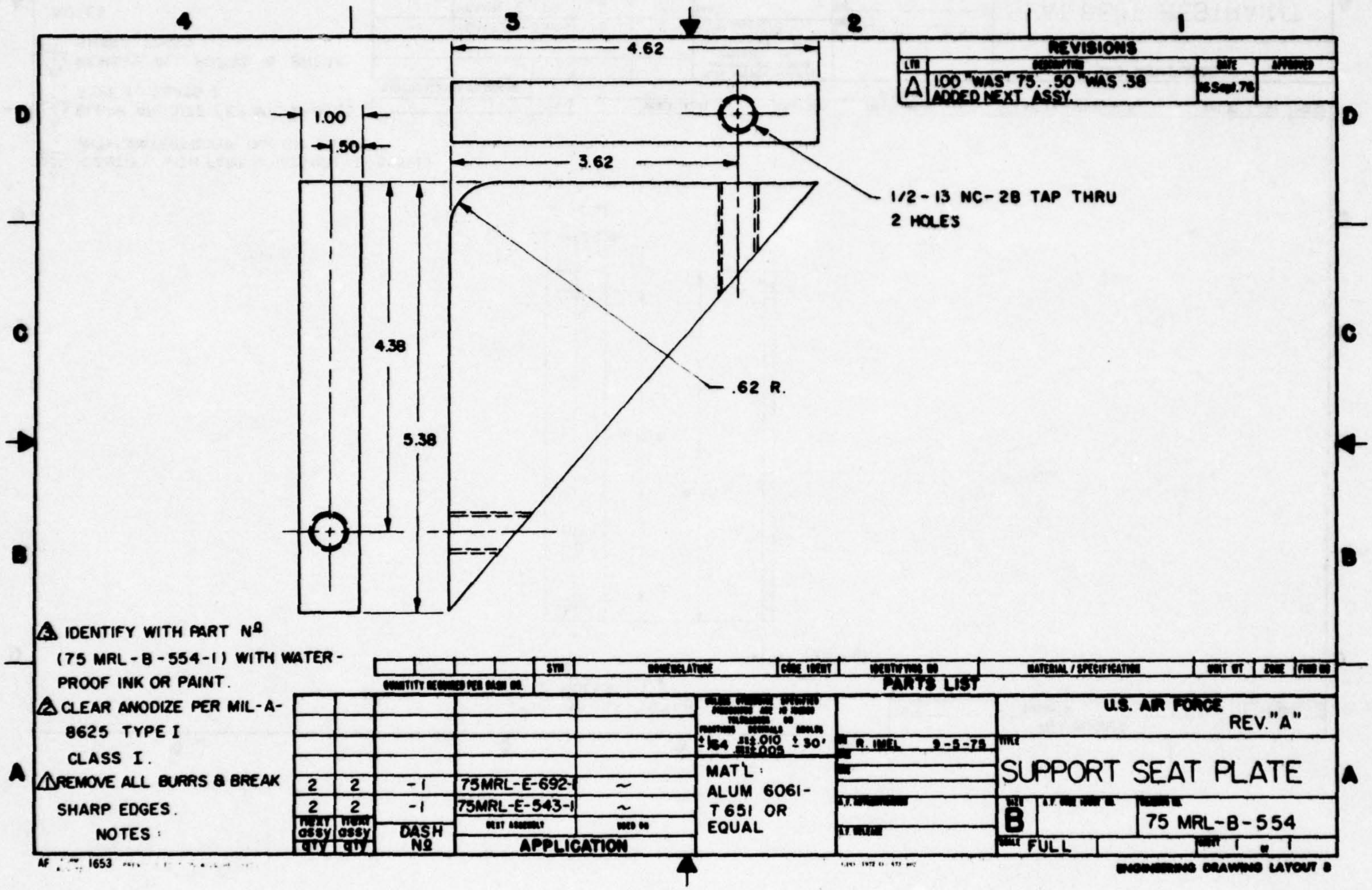


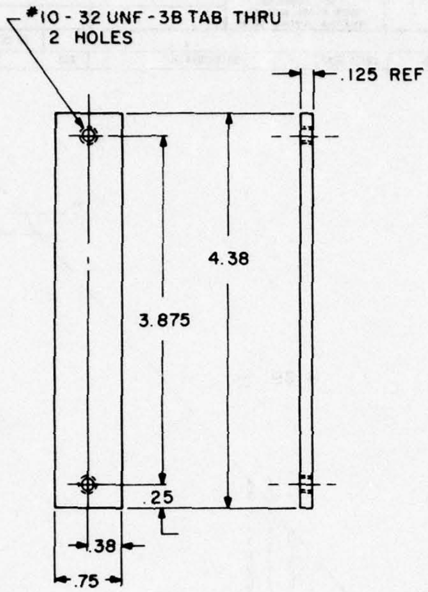
4
3
2
1
D
C
B
A
REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
LET J (.2770) DRILL THRU
3 HOLES
.12 R 4 PLACES
.44 R
3.00
2.250
1.500
.38
-1 PLATE
.50
.375
2.625
3.000
4.00
1/4
REF.
SYM
NOMENCLATURE
CODE IDENT
IDENTIFYING NO
MATERIAL / SPECIFICATION
UNIT WT
ZONE
FIND NO
QUANTITY REQUIRED PER DASH NO.
PARTS LIST
U.S. AIR FORCE
REMOVE ALL BURRS
& BREAK SHARP EDGES
NOTES:
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± 1/64 .XX± .010 .XXX± .005 ±
R. IMEL 9-4-75
TITLE
PLATE, SUPPORT REAR
1 1 -1 75MRL-C-550-3 75MRL-E-543
1 1 -1 75MRL-C-550-1 75MRL-E-543
MAT'L:
1/4 THK ALUM
6061-T651
OR EQUAL
NEXT ASSY QTY.
FINAL ASSY QTY.
NEXT ASSEMBLY
USED ON
APPLICATION
B
75 MRL-B-551
FULL
1 of 1
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.
ENGINEERING DRAWING LAYOUT B


REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
ANGLE
-1
1.50(REF)
1.50
(REF)
20 1/2
NOTE:
REMOVE ALL BURRS & BREAK SHARP EDGES
QUANTITY REQUIRED PER DASH NO.
PARTS LIST
U.S. AIR FORCE
MAT'L:
1 1/2 x 1 1/2 x 1/8
ALUM. ANGLE
SHARP CORNER
6063-T52 or EQ.
R. IMEL 9-5-75
TITLE
ANGLE, SUPPORT REAR
SIZE
B
75 MRL-B-552
SCALE 1/2" = 1"
75MRL-C-550-3
75MRL-C-550-1
NEXT ASSEMBLY
APPLICATION
DASH NO.
NEXT ASSY
FINAL ASSY
QUANTITY REQUIRED
AF FORM 1653
ENGINEERING DRAWING LAYOUT B



CHAM .125x45°, 2 PLACES
1.000
.50
1.125 TYP
.125 TYP
3.88
.250 TYP
2.562 TYP
.687 FOR -1 ONLY
6
2 HOLES REQ'D
F
2 HOLES REQ'D
10-32 UNF-2B
TAP 3/4 DP
3 HOLES
-1 SUPPORT
3 IDENTIFY WITH PART NO (75 MRL-D-553-1, OR 3) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
-1 | 13.290 | 12.562 | 9.625 | 6.625 | 3.625
DASH NO | A | B | C | D | E | F TAPPED HOLE | G TAPPED HOLE
MATL
ALUM 6061-T651
OR EQUAL
REV "B"
SUPPORT RAIL & BASE
D
75 MRL-D-553


REVISIONS
LTR | DESCRIPTION | DATE | APPROVED
A | 1.00 "WAS" .75. .50 "WAS .38 ADDED NEXT ASSY. | 16 Sept.76
4.62
1.00
.50
3.62
4.38
5.38
1/2-13 NC-2B TAP THRU
2 HOLES
.62 R.
3 IDENTIFY WITH PART Nº (75 MRL-B-554-1) WITH WATER-PROOF INK OR PAINT.
2 CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES.
NOTES:
PARTS LIST
2 2 -1 75MRL-E-692-1 ~
2 2 -1 75MRL-E-543-1 ~
DASH Nº
APPLICATION
MAT'L: ALUM 6061-T651 OR EQUAL
R. IBEL 9-5-75
U.S. AIR FORCE
REV."A"
SUPPORT SEAT PLATE
B
75 MRL-B-554
FULL
ENGINEERING DRAWING LAYOUT B



NOTES:

1. REMOVE ALL BURRS & BREAK SHARP EDGES.
2. CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I.
3. IDENTIFY WITH PART NO (75MRL-B-555-1) WITH WATERPROOF INK OR PAINT

QUANTITY REQUIRED PER DASH NO.				SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-1	76MRL-E-692-1	2	2
-1	76MRL-E-179	2	2
-1	75MRL-E-543	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± 1/64 .XX ± .010 .XXX ± .005 ±

MAT'L .125 THK ALUM 6061-T6 OR EQUAL

DR R. Imel 9-8-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

TITLE SEAT BELT RESTRAINT

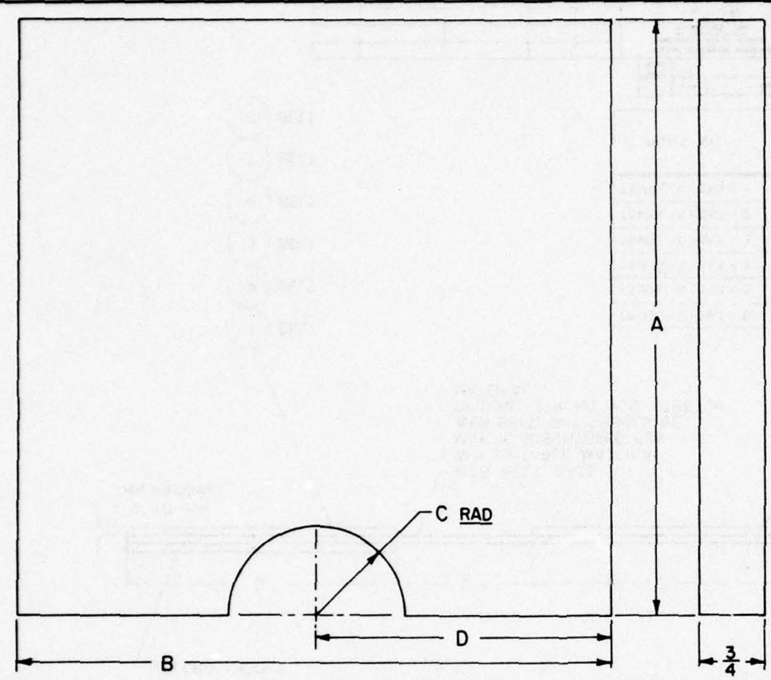
SIZE B A.F. CODE IDENT NO. DRAWING NO. 75MRL-B-555

SCALE FULL SHEET 1 of 1

AF 1653

ENGINEERING DRAWING LAYOUT B

-5				
-3	$5\frac{3}{4}$	$5\frac{3}{4}$	$\frac{3}{4}$	$2\frac{7}{8}$
-1	$6\frac{3}{4}$	$6\frac{3}{4}$	1"	$3\frac{3}{8}$
DASH NO	A	B	C	D



REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

QUANTITY REQUIRED PER DASH NO. | SYM | NOMENCLATURE | CODE IDENT | IDENTIFYING NO | MATERIAL / SPECIFICATION | UNIT WT | ZONE | FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-3	76MRL-E-179	1	1
-3	75MRL-E-692	1	1
-1	75MRL-E-543	1	1

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± 1/8

MAT'L.: ENERGY ABSORBING PADDING CODE A.H. INSULITE UNIROYLE RUBBER CO.

DR RAY DICKEY 10-10-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

TITLE PAD, SEAT SUPPORT

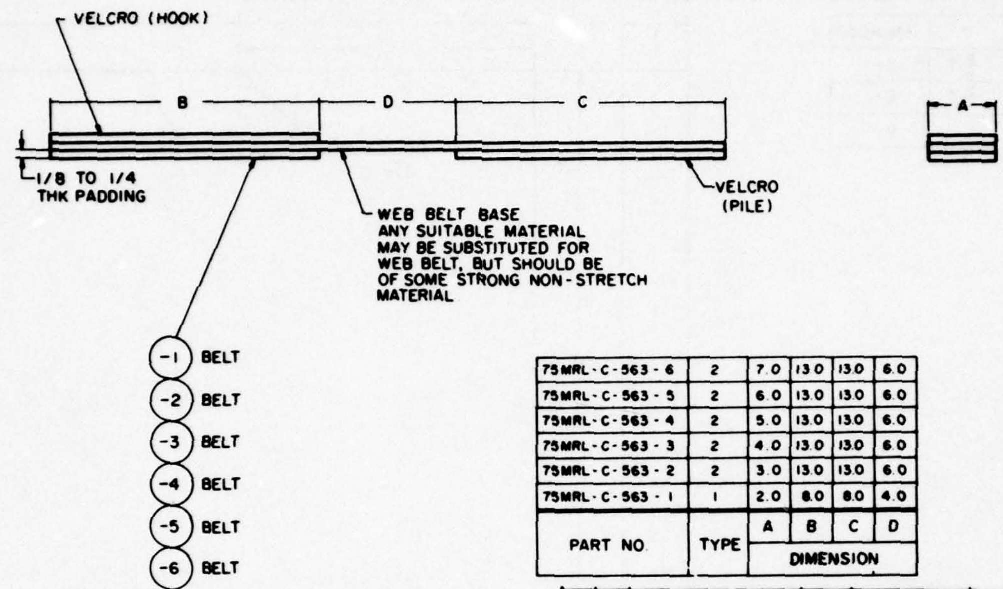
SIZE B | DRAWING NO. 75MRL-B-562

SCALE FULL | SHEET

AF FORM AUG 72 1653 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED -6 & REVISED APPLICATION BLOCK	12-16-76	WLF



PART NO.	TYPE	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D
75MRL-C-563-6	2	7.0	13.0	13.0	6.0
75MRL-C-563-5	2	6.0	13.0	13.0	6.0
75MRL-C-563-4	2	5.0	13.0	13.0	6.0
75MRL-C-563-3	2	4.0	13.0	13.0	6.0
75MRL-C-563-2	2	3.0	13.0	13.0	6.0
75MRL-C-563-1	1	2.0	8.0	8.0	4.0

LIST OF MATERIALS

DASH NO.	APPLICATION		QTY REQD	
-6	75MRL-E-549-1	-	1	1
-4	75MRL-E-543-1	-	1	1
-2	75MRL-E-682-1	-	1	1
-1	75MRL-E-682-1	-	2	2
-5	75MRL-E-543-1	-	1	1
-3	75MRL-E-543-1	-	1	1
-1	75MRL-E-543-1	-	1	1

TOLERANCES: FRACTIONS ±1/32; .XX ±.031; .XXX ±.015; ANGLES ±0°30'

SEE F/D (FIELD OF DRAWING)

R. Imel 9-9-75

U.S. AIR FORCE

REV. "A"

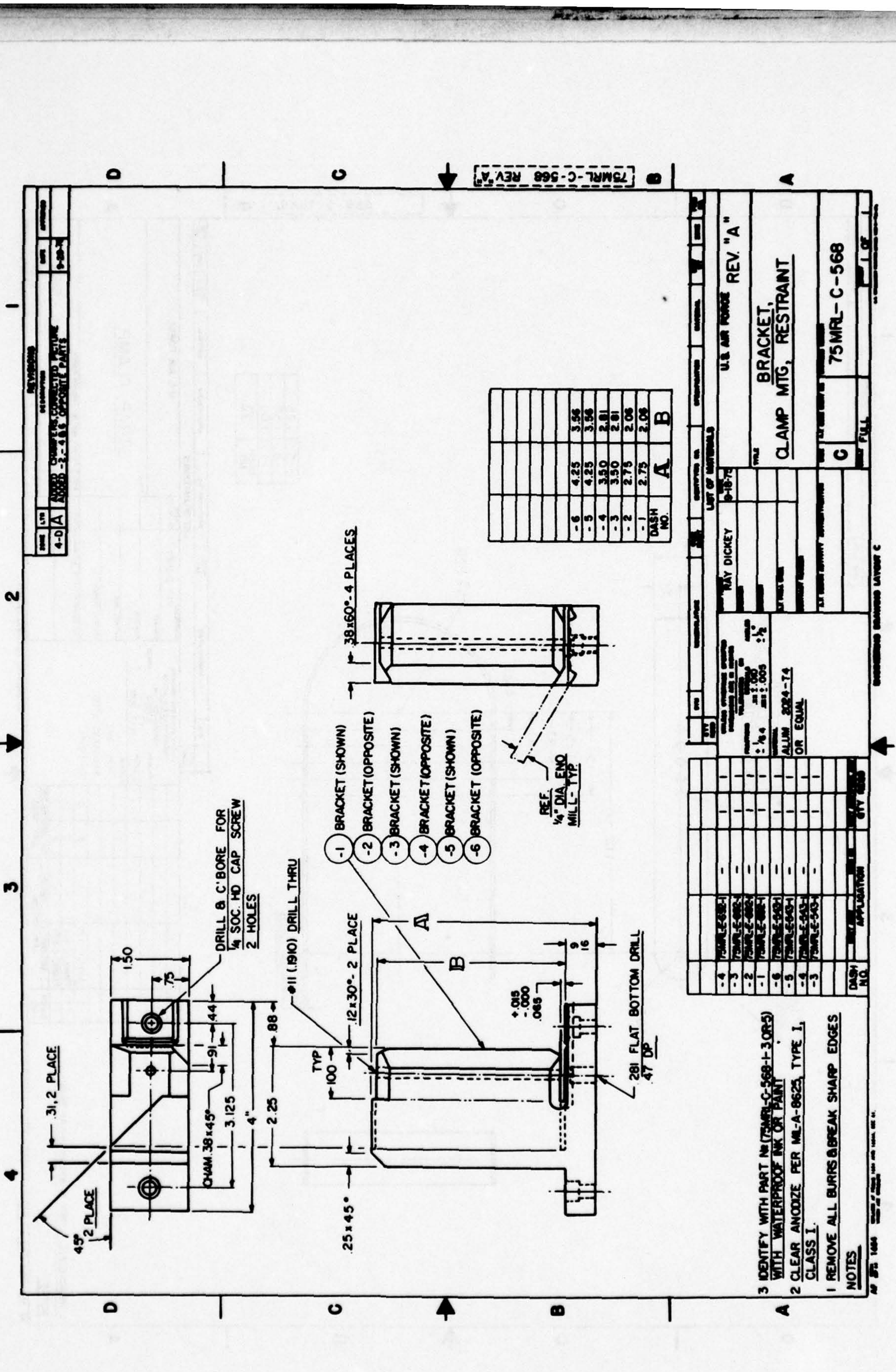
BELT, RESTRAINT, ASSY-OF, ACCELERATION

SIZE C — 75MRL-C-563

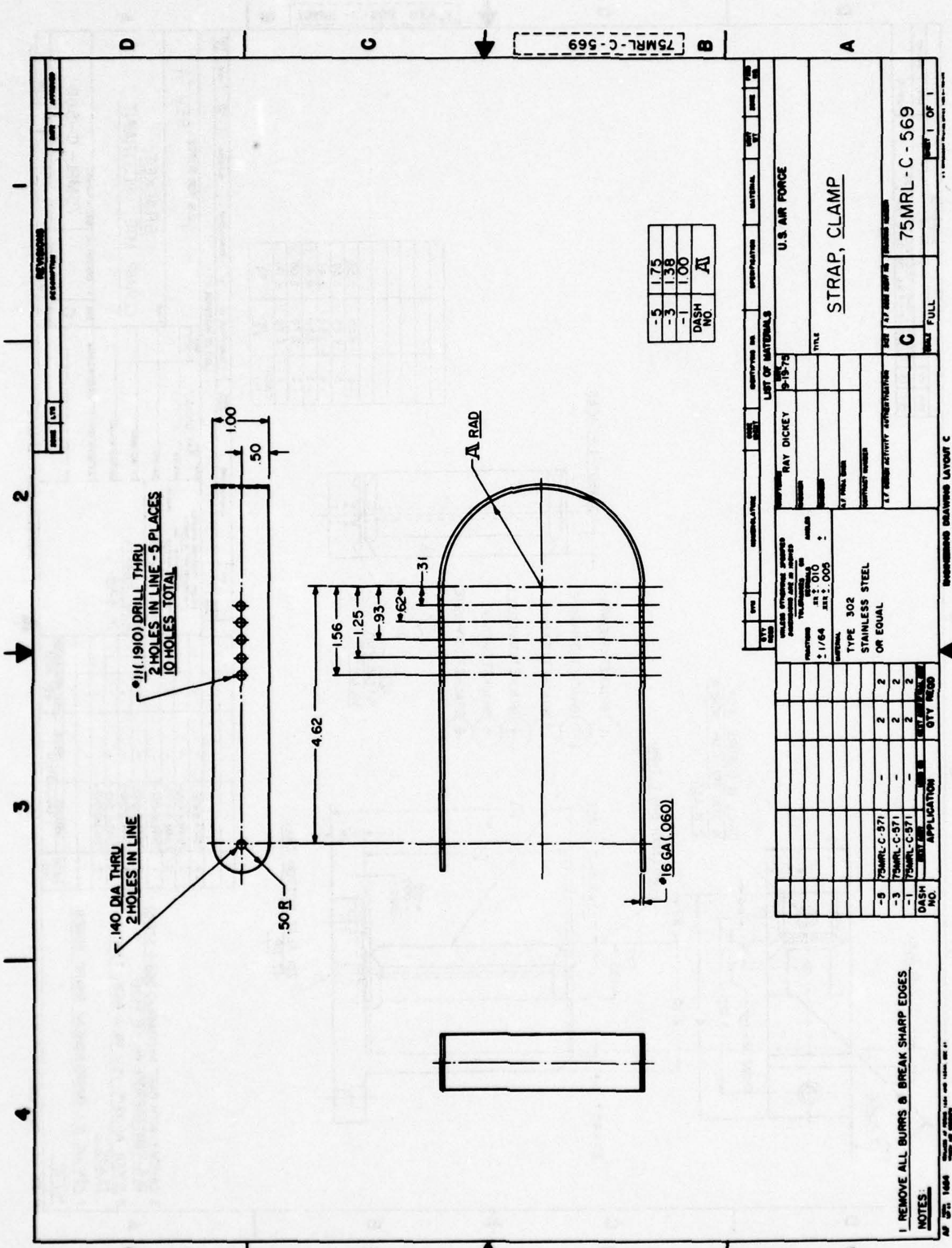
SHEET 1 OF 1

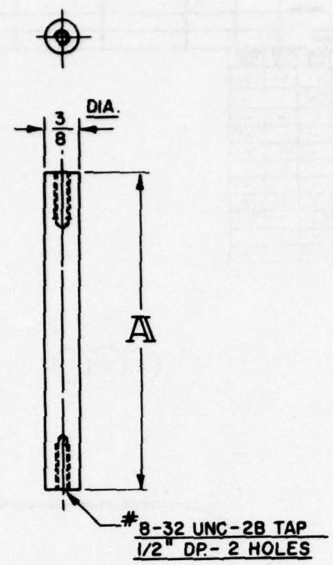
ENGINEERING DRAWING LAYOUT C

75MRL-C-563 REV A



75MRL-C-568 REV. "A"
45° 2 PLACE
.31, 2 PLACE
1.50
.75
DRILL & C'BORE FOR 1/4 SOC. HD CAP SCREW 2 HOLES
CHAM .38 x 45°
.91
.44
3.125
4"
2.25
.88
#11 (.1910) DRILL THRU
TYP .100
.12 x 30° 2 PLACE
.25 x 45°
A
B
9/16
+.015 -.000 .065
.281 FLAT BOTTOM DRILL .47 DP
-1 BRACKET (SHOWN)
-2 BRACKET (OPPOSITE)
-3 BRACKET (SHOWN)
-4 BRACKET (OPPOSITE)
-5 BRACKET (SHOWN)
-6 BRACKET (OPPOSITE)
REF. 1/4" DIA END MILL - TYP
.38 x 60° 4 PLACES
-6 4.25 3.56
-5 4.25 3.56
-4 3.50 2.81
-3 3.50 2.81
-2 2.75 2.06
-1 2.75 2.06
DASH NO. A B
3 IDENTIFY WITH PART № (75MRL-C-568-1-3 OR-5) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES
ALUM 2024-T4 OR EQUAL
RAY DICKEY
U.S. AIR FORCE
BRACKET, CLAMP MTG, RESTRAINT
REV. "A"
C
FULL
75MRL-C-568


75MRL-C-569
REVISIONS
.140 DIA THRU
2 HOLES IN LINE
.50 R
*11(.1910) DRILL THRU
2 HOLES IN LINE-5 PLACES
10 HOLES TOTAL
1.00
.50
4.62
1.56
1.25
.93
.62
.31
A RAD
*16 GA (.060)
-5 1.75
-3 1.38
-1 1.00
DASH NO A
1. REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
-5 75MRL-C-571
-3 75MRL-C-571
-1 75MRL-C-571
DASH NO. APPLICATION
QTY REQD
LIST OF MATERIALS
±1/64
.XX ±.010
.XXX ±.005
TYPE 302
STAINLESS STEEL
OR EQUAL
RAY DICKEY
9-19-75
U.S. AIR FORCE
STRAP, CLAMP
C
75MRL-C-569
FULL
1 OF 1
ENGINEERING DRAWING LAYOUT C



DASH NO	A
-5	3.50
-3	2.75
-1	2.00

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

NOTES:

1 REMOVE ALL BURRS & BREAK SHARP EDGES.

2 CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY. QTY.	FINAL ASSY. QTY.
-5	75MRL-C-571	2	2
-3	75MRL-C-571	2	2
-1	75MRL-C-571	2	2

APPLICATION

MAT'L. ALUM. 6061-T6 OR EQUAL

RAY DICKEY 9-19-75

U.S. AIR FORCE

TITLE: SPACER, CLAMP

SIZE: B

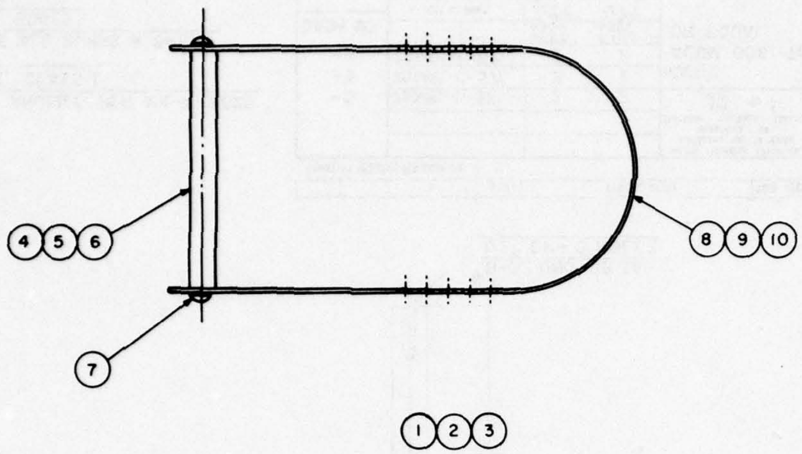
DRAWING NO. 75MRL-B-570

SCALE: FULL

SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B



ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED APPLICATION BLOCK	10-13-76	WLF

QTY REQD -5	QTY REQD -3	QTY REQD -1	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO.	SPECIFICATION	MATERIAL	UNIT WT	ZONE	FIND NO.
1	–	–		STRAP, CLAMP		75MRL-C-569-5					10
–	1	–		STRAP, CLAMP		75MRL-C-569-3					9
–	–	1		STRAP, CLAMP		75MRL-C-569-1					8
2	2	2	△	SCR. MACH PAN HD		MS51957-107					7
1	–	–		SPACER, CLAMP		75MRL-B-570-5					6
–	1	–		SPACER, CLAMP		75MRL-B-570-3					5
–	–	1		SPACER, CLAMP		75MRL-B-570-1					4
	–	–		STRAP, CLAMP ASSY		75MRL-C-571-5					3
–		–		STRAP, CLAMP ASSY		75MRL-C-571-3					2
–	–			STRAP, CLAMP ASSY		75MRL-C-571-1					1

LIST OF MATERIALS

DASH NO.	NEXT ASSY	USED ON	QTY REQD	
-3	75MRL-E-692-1	–	2	2
-1	75MRL-E-692-1	–	2	2
-5	75MRL-E-543	–	2	2
-3	75MRL-E-543	–	2	2

△ SCREW, MACH. PAN HD # 8-32 UNC-2A × .50 LG

DRAWN: RAY DICKEY — DATE: 9-19-75

U.S. AIR FORCE

TITLE: STRAP, CLAMP ASSY

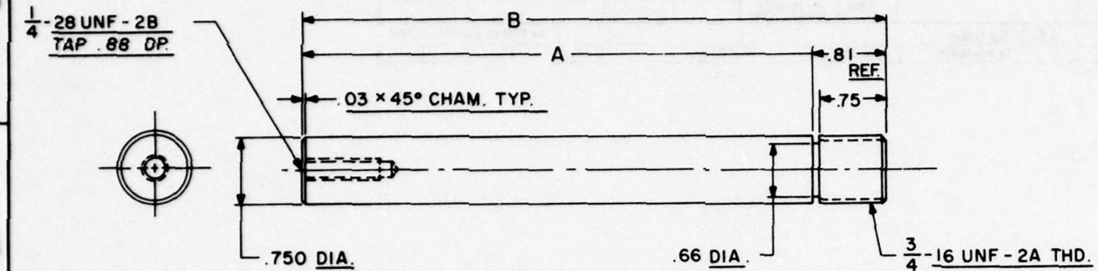
SIZE: C — DRAWING NUMBER: 75MRL-C-571 — REV "A"

SCALE: FULL — SHEET 1 OF 1

ENGINEERING DRAWING LAYOUT C

AF 1484

75MRL-C-571



DASH NO	A	B
-7	8.50	9.31
-5	7.50	8.31
-3	6.50	7.31
-1	5.50	6.31

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY REQUIRED	FINAL ASSY QTY REQUIRED
-7	75MRL-E-692-1	2	2
-5	75MRL-E-692-1	2	2
-3	75MRL-E-692-1	2	2
-1	75MRL-E-692-1	2	2

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-7	75MRL-E-433	2	2
-5	75MRL-E-433	2	2
-3	75MRL-E-433	2	2
-1	75MRL-E-433	2	2

APPLICATION

SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

PARTS LIST

NOTES:
1 REMOVE ALL BURRS & BREAK SHARP EDGES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES

MATL. COLD DRAWN LEDLOY

RAY DICKEY 10-20-75

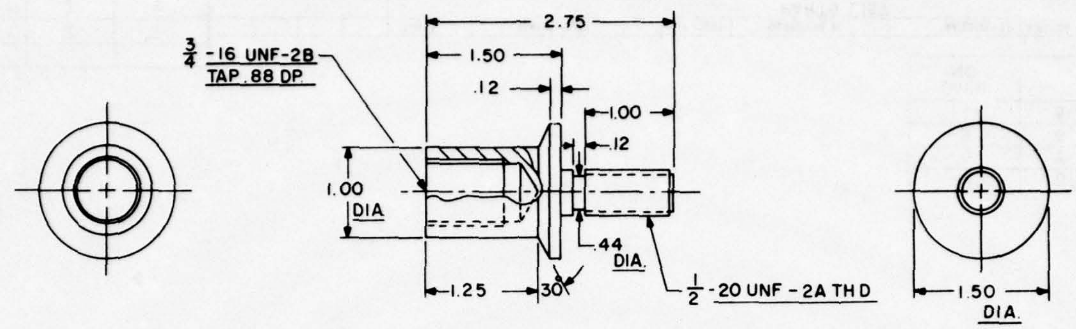
U.S. AIR FORCE

TITLE: ROD, GUIDE

SIZE: B
DRAWING NO. 75MRL-B-647
SCALE: FULL
SHEET 1 OF 1

AF FORM 1653

ENGINEERING DRAWING LAYOUT B



REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

1. REMOVE ALL BURRS & BREAK ALL SHARP EDGES.

NOTES

PARTS LIST

QUANTITY REQUIRED PER DASH NO.			SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

DASH No	NEXT ASSEMBLY	QTY NEXT ASSY	QTY FINAL ASSY
-1	76MRL-E-179	2	2
-1	75MRL-E-692	2	2
~~-1~~	~~75MRL-E-433~~	~~2~~	~~2~~
-1	75MRL-E-433	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm\frac{1}{64}$ DECIMALS .XX $\pm$ .010 .XXX $\pm$ .005 ANGLES $\pm$ 30'

MAT'L, COLD DRAWN LEDLOY

DR RAY DICKEY 10-20-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

TITLE HOLDER, THDED, ROD GUIDE

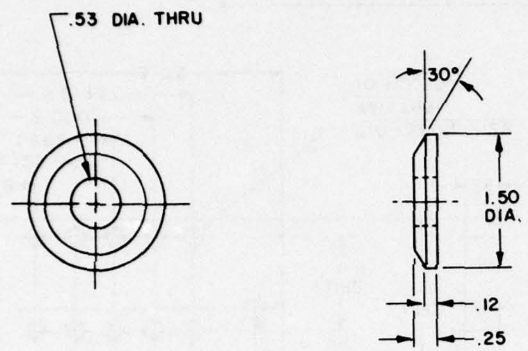
SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-648

SCALE FULL | SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED

GPO 1972 O - 473-602

ENGINEERING DRAWING LAYOUT B



REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

NOTES:

1. REMOVE ALL BURRS & BREAK SHARP EDGES.

PARTS LIST

				SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

QUANTITY REQUIRED PER DASH NO.

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-1	76MRL-E-179	2	2
-1	75MRL-E-692	2	2
-1	75MRL-E-433	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS .XX ± .010 .XXX ± .005 ANGLES ± 1/2°

MATL. 1018 C.R.S.

FINISH: CAD PLATE

DR RAY DICKEY 10-21-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

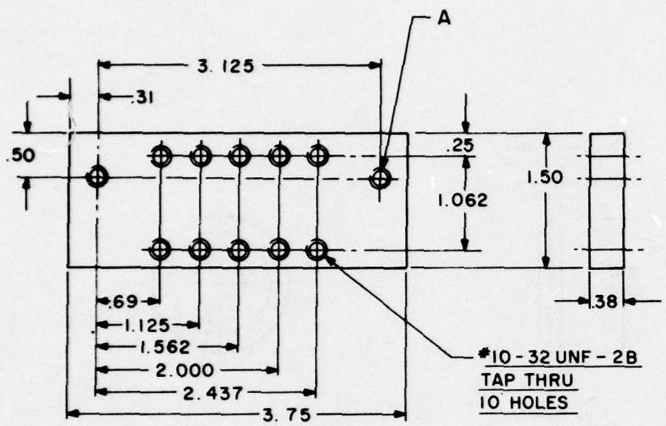
TITLE WASHER, ROD GUIDE

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-649

SCALE FULL | SHEET 1 of 1

AF FORM AUG 72 1653 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B



DASH NO.	A	NO. REQ'D
-3	.26 $^{+.010}_{-.00}$ DIA. THRU	2
-1	#10-32 UNF - 2B TAP THRU	2

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

NOTES:

1. REMOVE ALL BURRS & BREAK SHARP EDGES.
2. CLEAR ANODIZE PER PER MIL-A-8625 TYPE I, CLASS I.
3. IDENTIFY WITH P/N (75MRL-E-B-652-1, OR -3) WITH WATERPROOF INK OR PAINT

PARTS LIST

QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

APPLICATION

DASH NO.	NEXT ASSY	QTY (NEXT ASSY)	QTY (FINAL ASSY)
-1	75MRL-E-692-1	2	2
-3	75MRL-E-692-1	4	4
-3	75MRL-E-543	2	2
-1	75MRL-E-543	2	2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS .XX± .XXX± ANGLES ±

MAT'L ALUM. 6061 - T651 OR EQUAL

RAY DICKEY 10/30/75

U.S. AIR FORCE

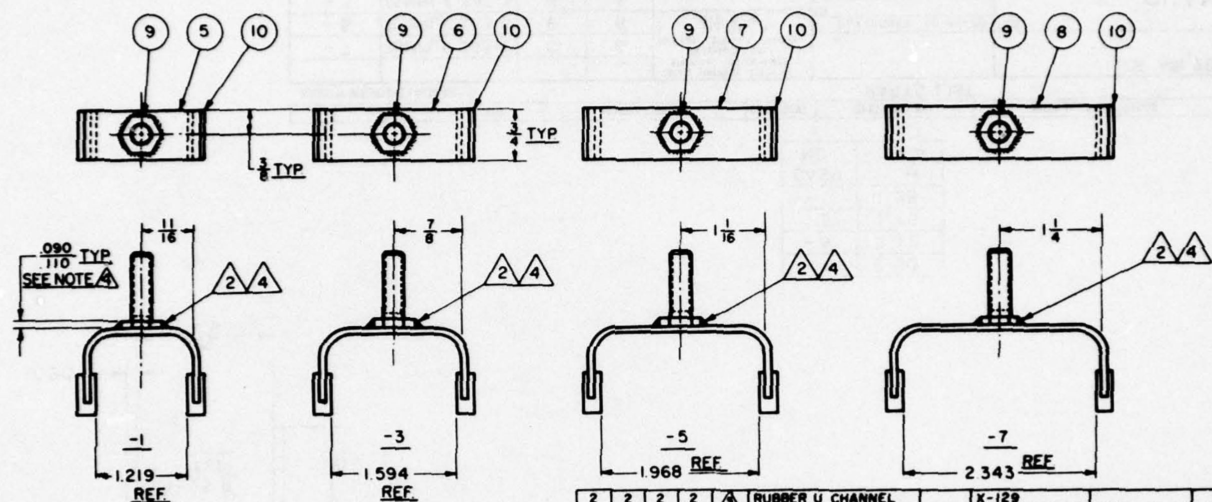
TITLE PLATE, CLAMP MOUNTING

SIZE B | DRAWING NO. 75MRL- B - 652

SCALE FULL | SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B



REV	DESCRIPTION	DATE	APPROVED
A	REVISED APPLICATION BLOCK	10-13-76	WLF

1 2 3 4
U-CLAMP UNIT

-7 QTY REQD	-5 QTY REQD	-3 QTY REQD	-1 QTY REQD		NOMENCLATURE	PART NO.	FIND NO.
2	2	2	2	3	RUBBER U CHANNEL	X-129	10
1	1	1	1	1 4	BOLT, HEX HD 1/4-20×1"	AN65-4-10	9
1	-	-	-		U - CLAMP	75MRL-B-654-7	8
-	1	-	-		U - CLAMP	75MRL-B-654-5	7
-	-	1	-		U - CLAMP	75MRL-B-654-3	6
-	-	-	1		U - CLAMP	75MRL-B-654-1	5
X	-	-	-		U - CLAMP, UNIT	75MRL-C-653-7	4
-	X	-	-		U - CLAMP, UNIT	75MRL-C-653-5	3
-	-	X	-		U - CLAMP, UNIT	75MRL-C-653-3	2
-	-	-	X		U - CLAMP, UNIT	75MRL-C-653-1	1

LIST OF MATERIALS

DASH NO.	APPLICATION		QTY REQD	
-5	75MRL-E-692-1	-	6	6
-3	75MRL-E-692-1	-	6	6
-1	75MRL-E-692-1	-	6	6
-7	75MRL-E-543-1	-	4	4
-5	75MRL-E-543-1	-	2	2
-3	75MRL-E-543-1	-	4	4

NOTES:

1. BOLT, HEX. HD. 1/4-20UNC-2×1" LG. STL. CAD PLATE
2. WELD BOLT, ITEM 9, TO CLAMP, ITEMS 5, 6, 7, OR 8 CENTRALLY, AS SHOWN.
3. COAT INSIDE OF CLAMP, ITEM 5, 6, 7 OR 8 WITH LIQUIDE RUBBER
4. GRIND OR MACHINE TOP OFF HEAD OF BOLT TO A DIM. OF .090/.110 AS SHOWN BEFORE WELDING. (SEE -1 DETAIL)
5. REF. SOURCE
   ATLANTIC INDIA RUBBER CO
   CHICAGO, ILL.
   PART NO. X-129 - 80 DUROMETER RUBBER

   ANCHOR RUBBER CO.
   DAYTON, OH.

TOLERANCES: FRACTIONS ± 1/64

RAY DICKEY | 10-22-75

U.S. AIR FORCE

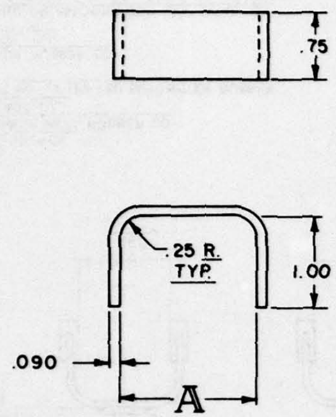
ASSY - U-CLAMP UNIT

SIZE C | 75MRL-C-653 | REV "A"

SCALE FULL | SHEET 1 OF 1

75MRL-C-653

ENGINEERING DRAWING LAYOUT C



DASH NO.	A
-7	2.50
-5	2.12
-3	1.75
-1	1.38

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

NOTES

1. REMOVE ALL BURRS & BREAKS SHARP EDGES

QUANTITY REQUIRED PER DASH NO. | STD | NOMENCLATURE | CODE IDENT | IDENTIFYING NO | MATERIAL / SPECIFICATION | UNIT WT | ZONE | FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-7	75MRL-C-563-7	6	6
-5	75MRL-C-563-5	6	6
-3	75MRL-C-563-3	6	6
-1	75MRL-C-563-1	6	6

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS .XX±.010 .XXX±.005 ANGLES ±

MAT'L. 1018 CRS

RAY DICKEY 10-31-75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

TITLE: U-CLAMP

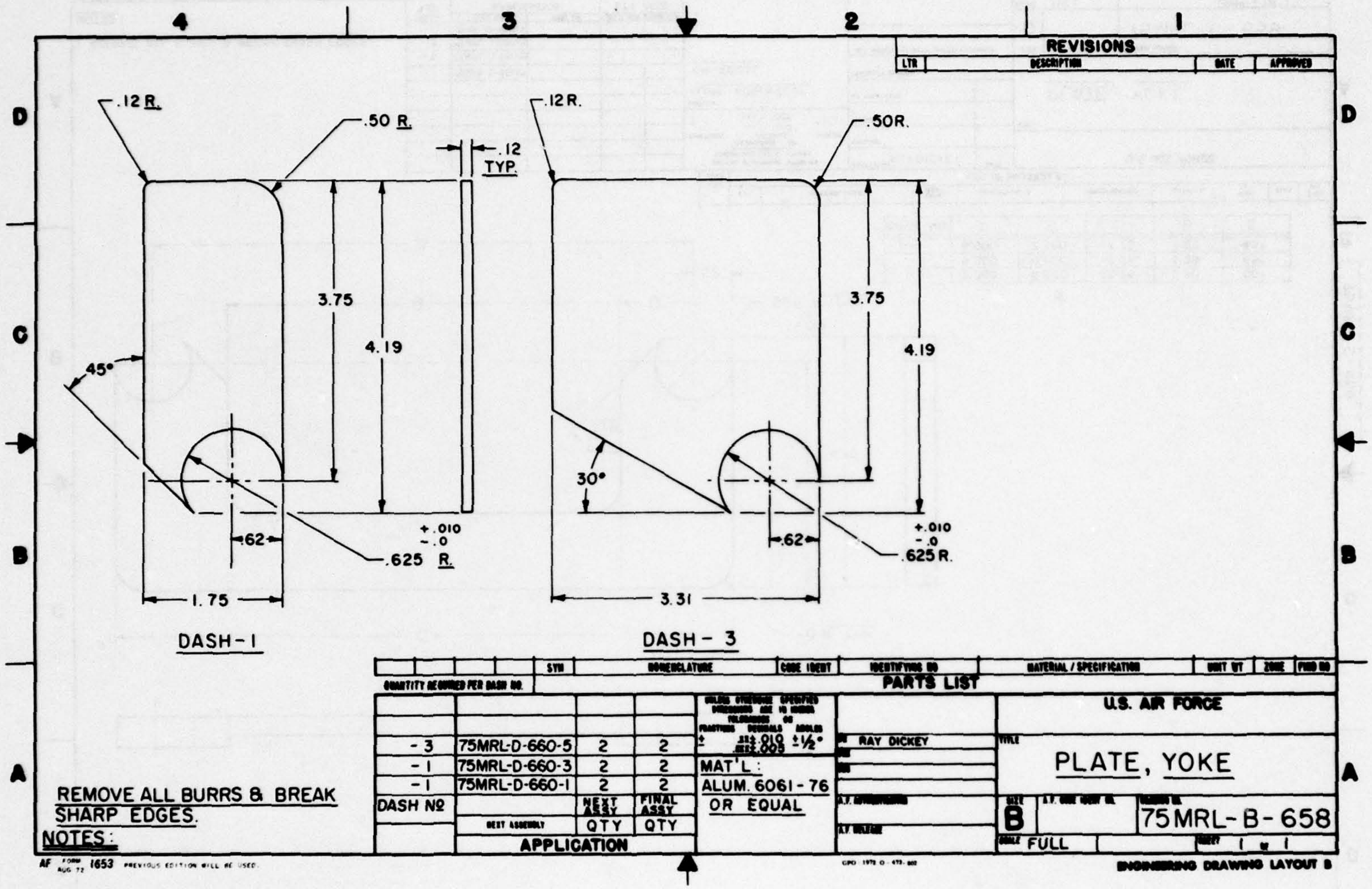
SIZE: B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-654

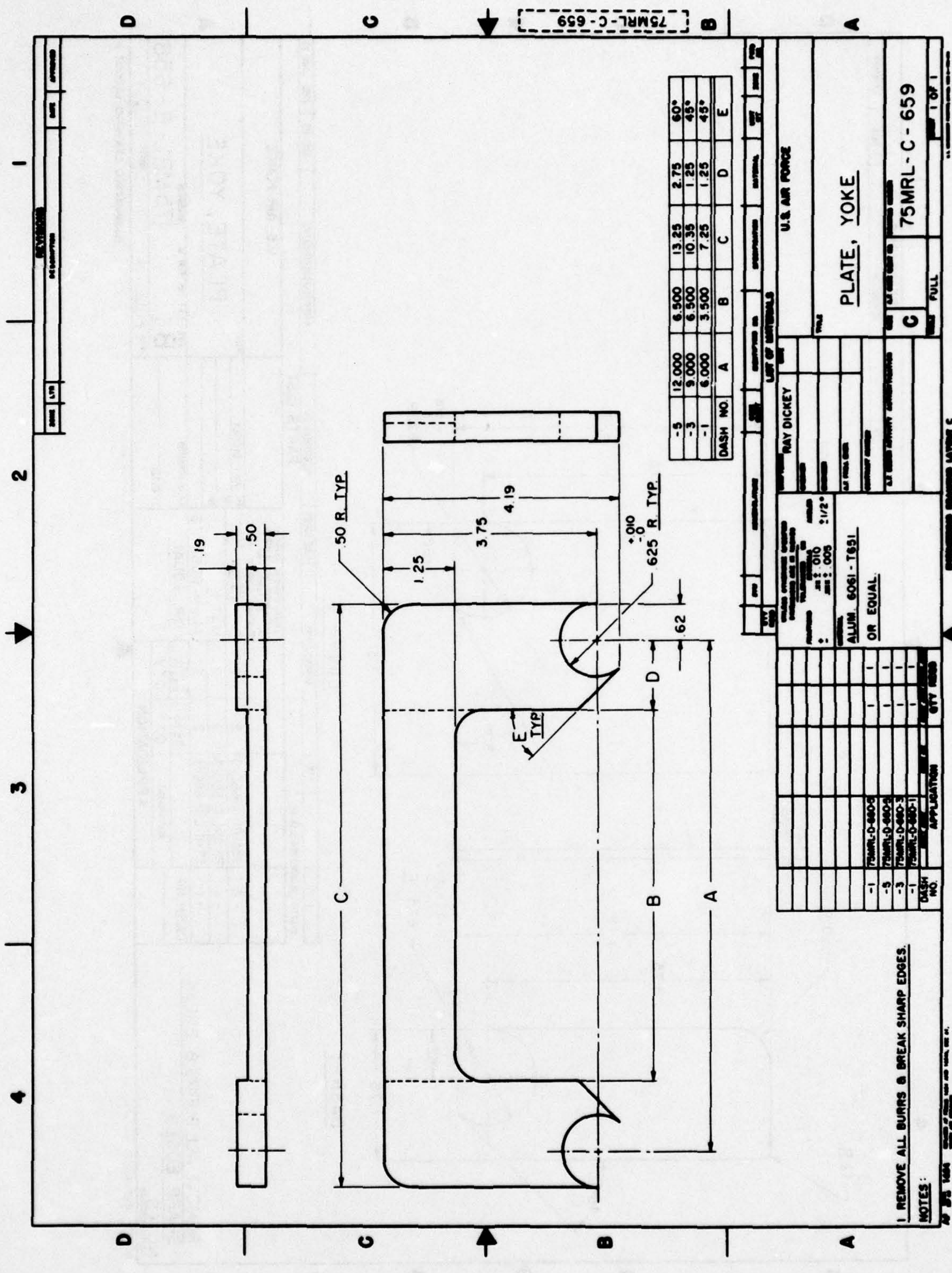
SCALE: FULL | SHEET 1 OF 1

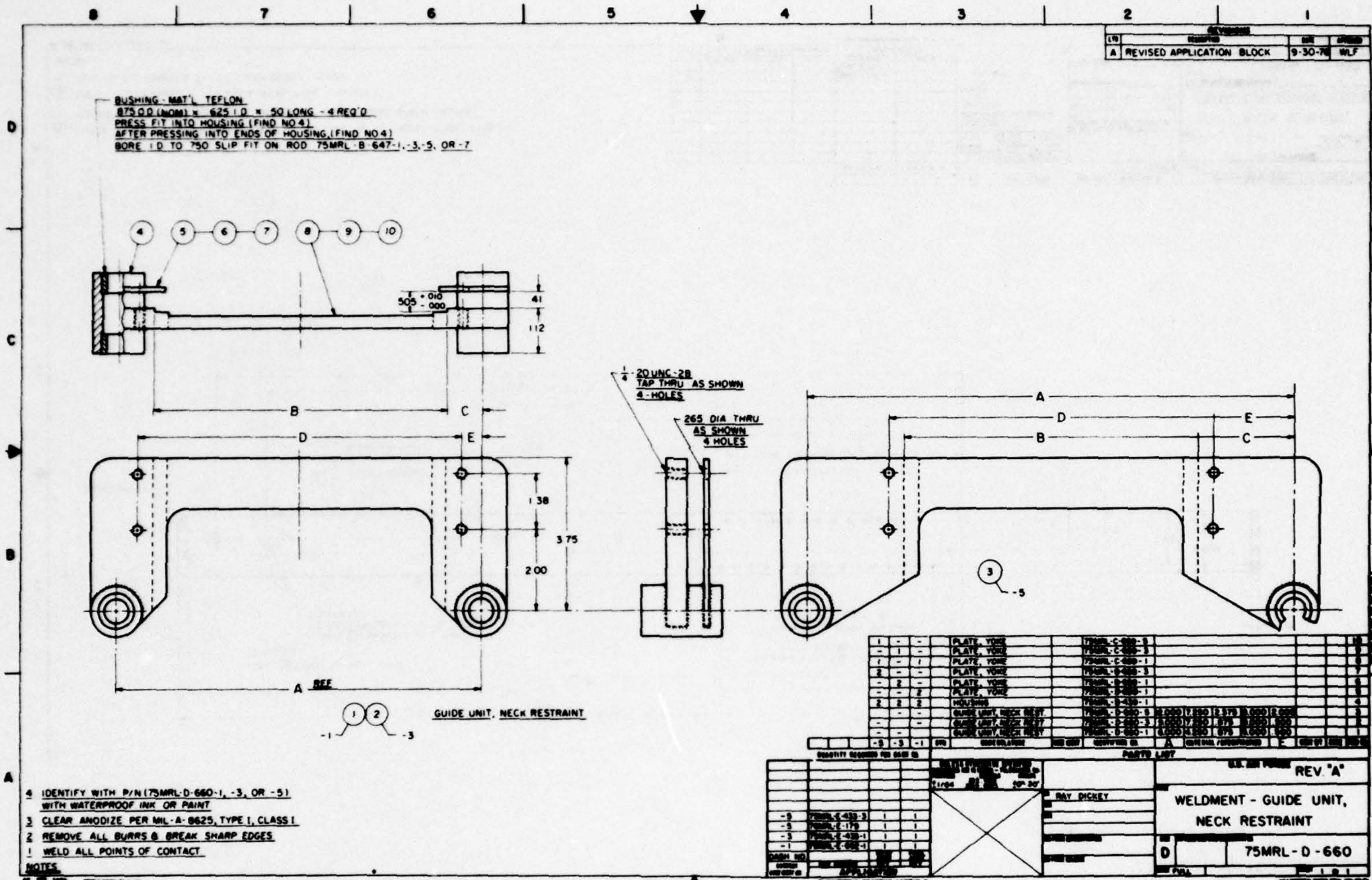
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

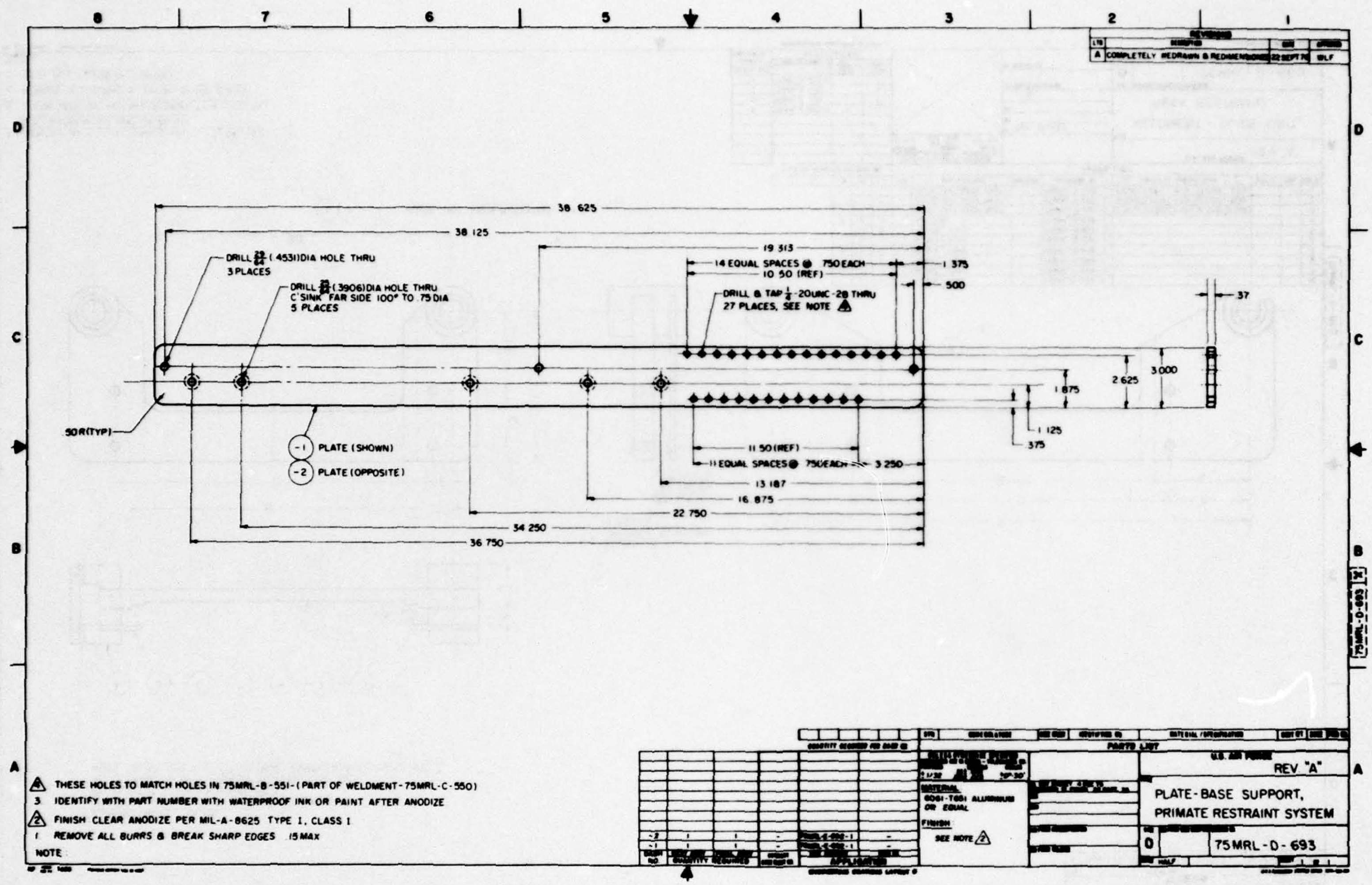
GPO 1972 O - 473-140

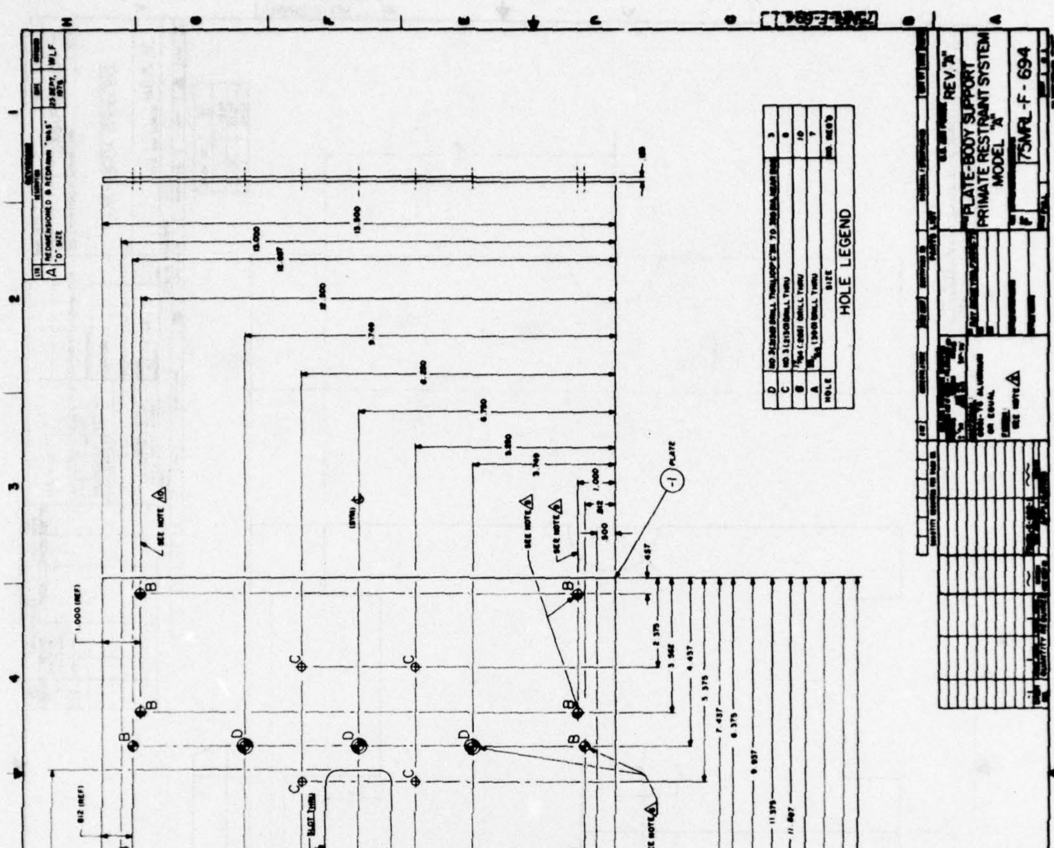
ENGINEERING DRAWING LAYOUT B

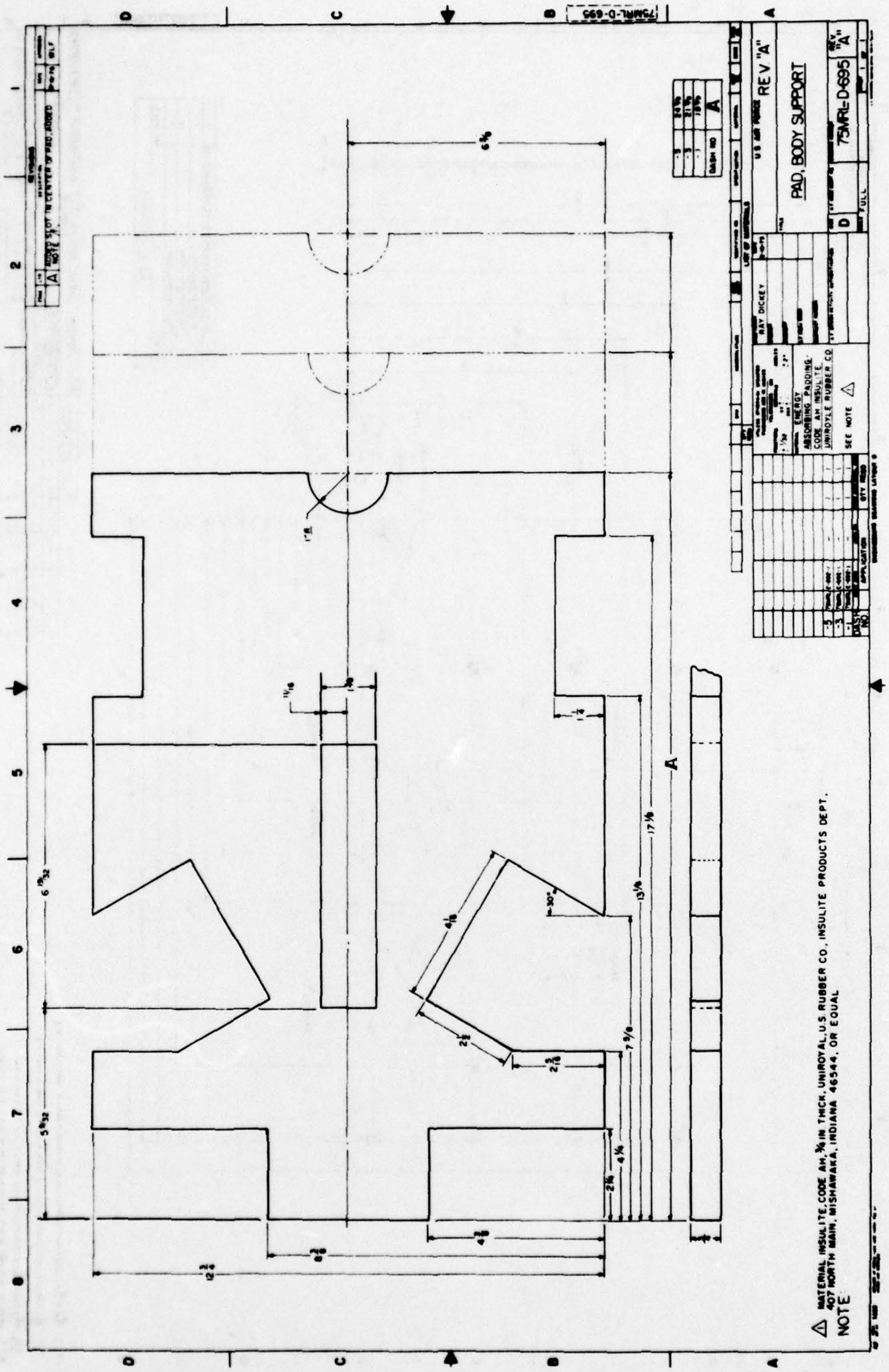

REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
.12 R.
.50 R.
.12 TYP.
3.75
4.19
45°
.62
+.010 -.0
.625 R.
1.75
DASH-1
.12 R.
.50R.
3.75
4.19
30°
.62
+.010 -.0
.625 R.
3.31
DASH - 3
REMOVE ALL BURRS & BREAK SHARP EDGES.
NOTES:
QUANTITY REQUIRED PER DASH NO.
SYM
NOMENCLATURE
CODE IDENT
IDENTIFYING NO
MATERIAL / SPECIFICATION
UNIT WT
ZONE
FIND NO
PARTS LIST
- 3 75MRL-D-660-5 2 2
- 1 75MRL-D-660-3 2 2
- 1 75MRL-D-660-1 2 2
DASH NO
NEXT ASSY
NEXT ASSY QTY
FINAL ASSY QTY
APPLICATION
MAT'L:
ALUM. 6061-76
OR EQUAL
RAY DICKEY
U.S. AIR FORCE
PLATE, YOKE
B
75MRL-B-658
FULL
1 of 1
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.
ENGINEERING DRAWING LAYOUT B

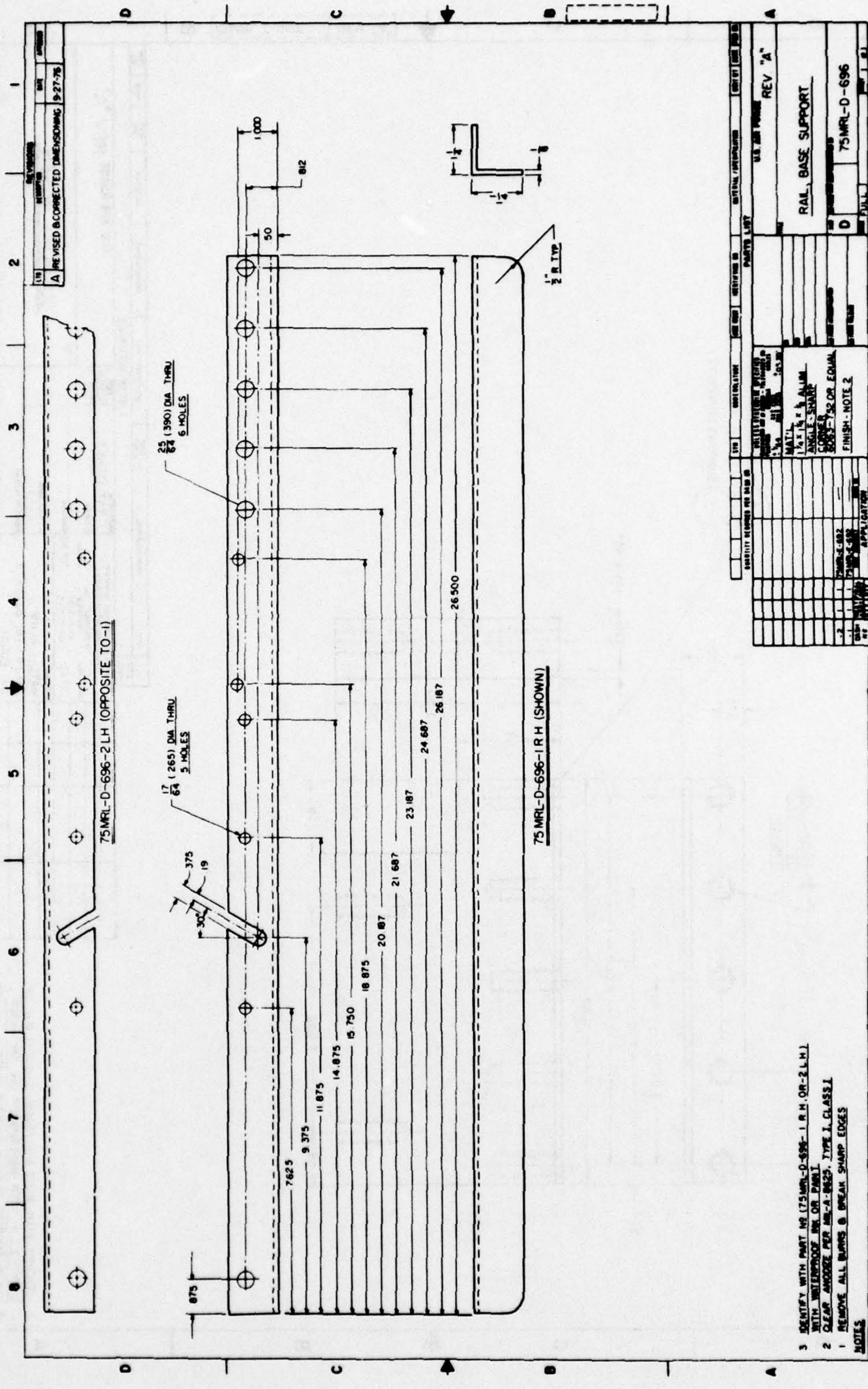

75MRL-C-659
PLATE, YOKE
U.S. AIR FORCE
RAY DICKEY
ALUM. 6061-T651
OR EQUAL
LIST OF MATERIALS
DASH NO. A B C D E
-1 6.000 3.500 7.25 1.25 45°
-3 9.000 6.500 10.35 1.25 45°
-5 12.000 6.500 13.25 2.75 60°
C FULL
1 OF 1
NOTES:
1 REMOVE ALL BURRS & BREAK SHARP EDGES.
.50 R TYP
.625 R TYP.
E TYP
1.25
3.75
4.19
.19
.50
.62

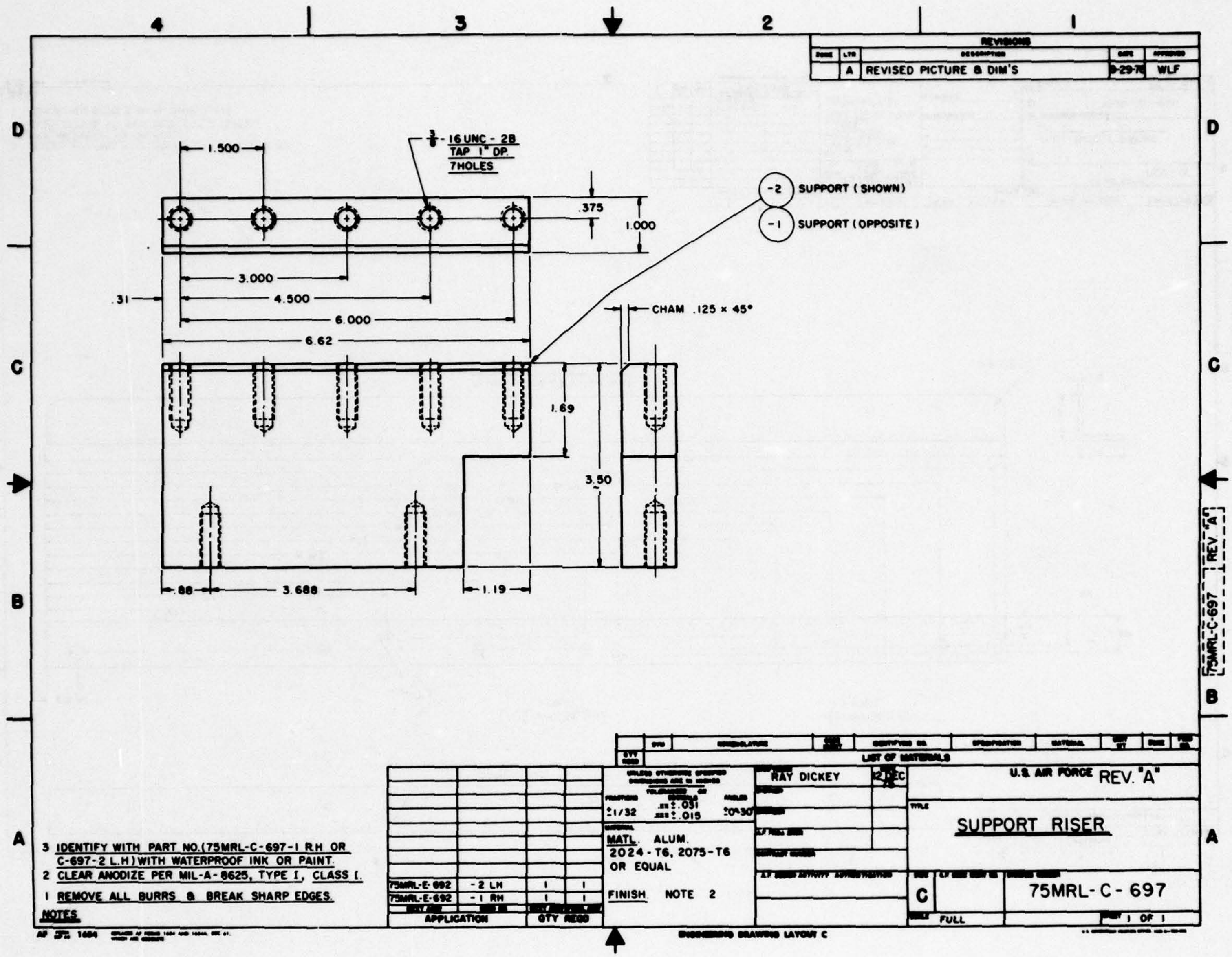

REVISED APPLICATION BLOCK 9-30-76 WLF
BUSHING - MAT'L TEFLON
.875 O.D.(NOM) x .625 I.D. x .50 LONG - 4 REQ'D
PRESS FIT INTO HOUSING (FIND NO 4)
AFTER PRESSING INTO ENDS OF HOUSING (FIND NO 4)
BORE I.D. TO .750 SLIP FIT ON ROD 75MRL-B-647-1, -3, -5, OR -7
1/4 - 20 UNC-2B TAP THRU AS SHOWN 4-HOLES
.265 DIA THRU AS SHOWN 4 HOLES
GUIDE UNIT, NECK RESTRAINT
4 IDENTIFY WITH P/N (75MRL-D-660-1, -3, OR -5) WITH WATERPROOF INK OR PAINT
3 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
2 REMOVE ALL BURRS & BREAK SHARP EDGES
1 WELD ALL POINTS OF CONTACT
NOTES
PARTS LIST
RAY DICKEY
REV. "A"
WELDMENT - GUIDE UNIT, NECK RESTRAINT
D 75MRL-D-660

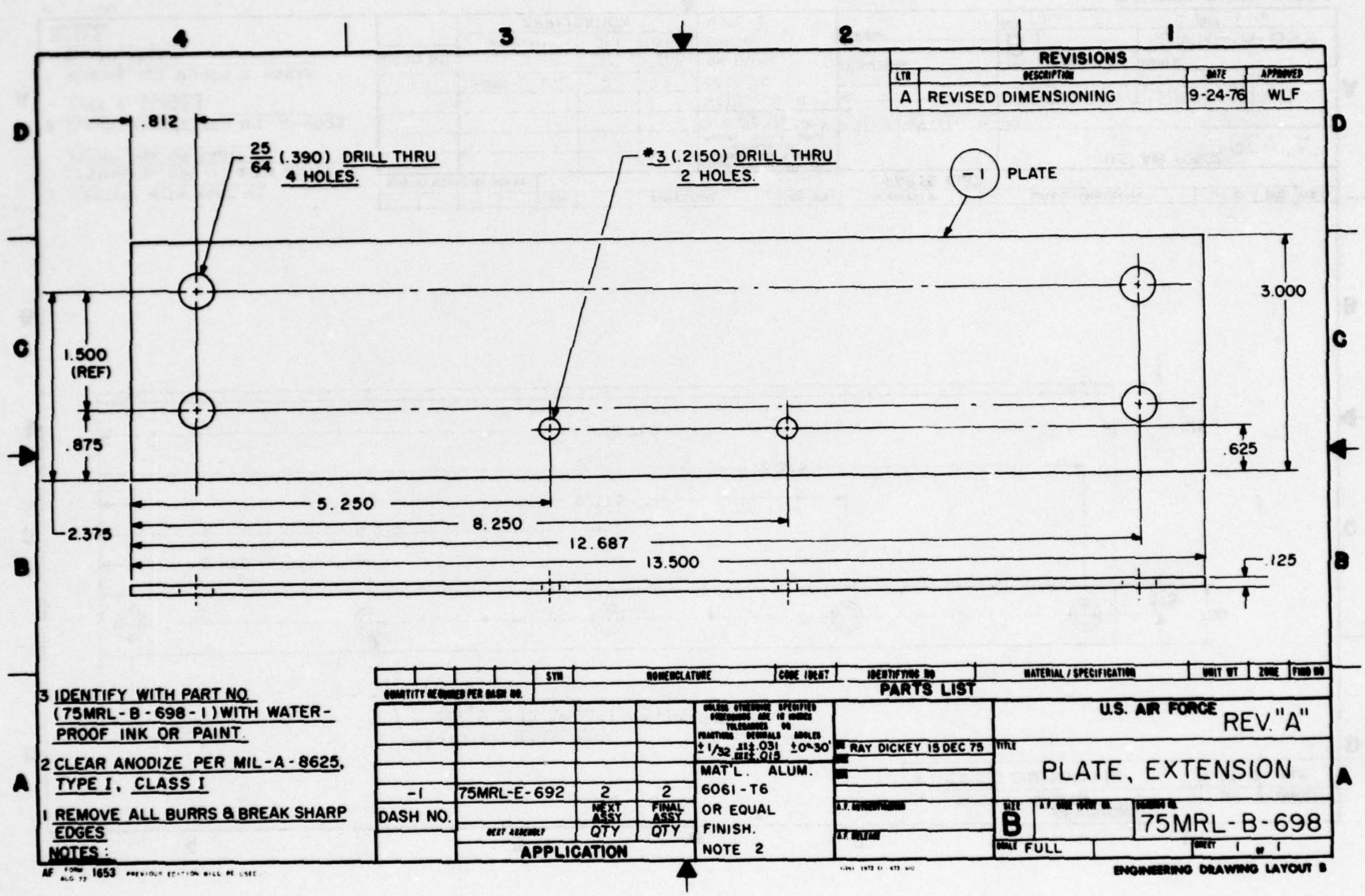

REVISIONS
A COMPLETELY REDRAWN & REDIMENSIONED 22 SEPT 76
38 625
38 125
19 313
14 EQUAL SPACES @ .750 EACH
10 50 (REF)
1 375
500
DRILL (.4531) DIA HOLE THRU
3 PLACES
DRILL (.3906) DIA HOLE THRU
C'SINK FAR SIDE 100° TO .75 DIA
5 PLACES
DRILL & TAP 1/4-20UNC-2B THRU
27 PLACES, SEE NOTE 4
37
3 000
2 625
1 875
1 125
375
50 R (TYP)
-1 PLATE (SHOWN)
-2 PLATE (OPPOSITE)
11 50 (REF)
11 EQUAL SPACES @ .750 EACH
3 250
13 187
16 875
22 750
34 250
36 750
4 THESE HOLES TO MATCH HOLES IN 75MRL-B-551-(PART OF WELDMENT-75MRL-C-550)
3 IDENTIFY WITH PART NUMBER WITH WATERPROOF INK OR PAINT AFTER ANODIZE
2 FINISH CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES .15 MAX
NOTE
PARTS LIST
MATERIAL
6061-T651 ALUMINUM OR EQUAL
FINISH
SEE NOTE 2
APPLICATION
U.S. AIR FORCE
REV "A"
PLATE-BASE SUPPORT,
PRIMATE RESTRAINT SYSTEM
D
75MRL-D-693


HOLE LEGEND
PLATE-BODY SUPPORT
PRIMATE RESTRAINT SYSTEM
MODEL "A"
75MRL-F-694
REV. "A"
NOTE

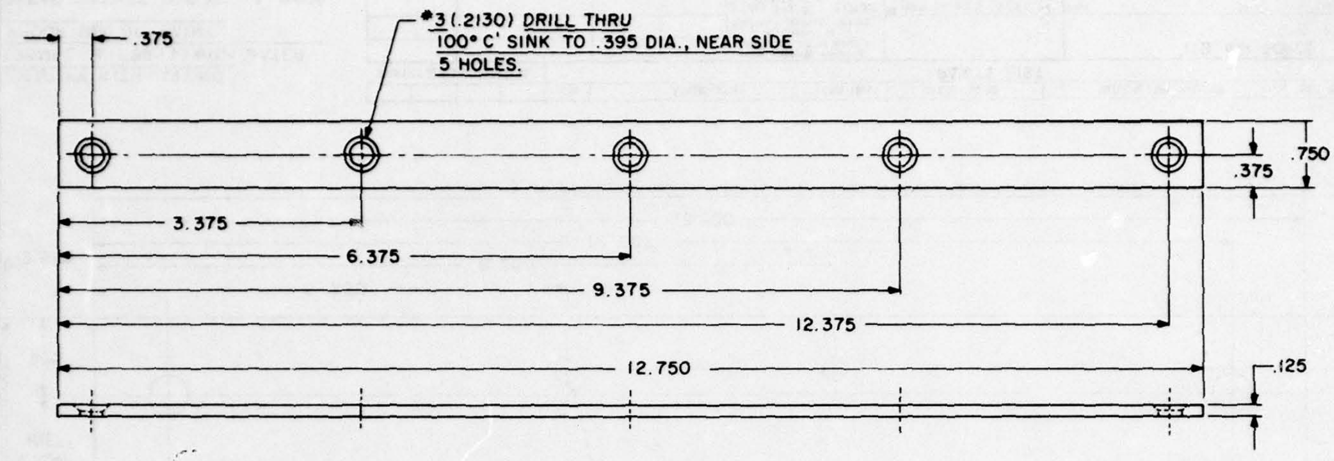

PAD, BODY SUPPORT
75MRL-D-695
REV "A"
US AIR FORCE
RAY DICKEY
ENERGY ABSORBING PADDING CODE AH INSULITE UNIROYAL RUBBER CO
SEE NOTE
NOTE
MATERIAL, INSULITE, CODE AH, 3/4 IN THICK, UNIROYAL, U.S. RUBBER CO, INSULITE PRODUCTS DEPT. 407 NORTH MAIN, MISHAWAKA, INDIANA 46544, OR EQUAL
FULL
DASH NO


REVISIONS
A REVISED & CORRECTED DIMENSIONING 9-27-75
75MRL-D-696-2 LH (OPPOSITE TO-1)
75MRL-D-696-1 R H (SHOWN)
25/64 (.390) DIA THRU 6 HOLES
17/64 (.265) DIA THRU 5 HOLES
1.000
.812
.50
.875
7.625
9.375
11.875
14.875
15.750
18.875
20.187
21.687
23.187
24.687
26.187
26.500
.375
.19
30°
1/2 R TYP
RAIL, BASE SUPPORT
REV "A"
75MRL-D-696
FINISH - NOTE 2
3 IDENTIFY WITH PART NO (75MRL-D-696-1 R.H. OR -2 L.H.) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES


REVISIONS
A REVISED PICTURE & DIM'S 9-29-76 WLF
3/8 - 16 UNC - 2B
TAP 1" DP.
7 HOLES
1.500
.375
1.000
3.000
4.500
6.000
6.62
.31
-2 SUPPORT (SHOWN)
-1 SUPPORT (OPPOSITE)
CHAM .125 × 45°
1.69
3.50
.88
3.688
1.19
75MRL-C-697 REV "A"
3 IDENTIFY WITH PART NO.(75MRL-C-697-1 R.H OR C-697-2 L.H) WITH WATERPROOF INK OR PAINT.
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES.
NOTES
75MRL-E-692 -2 LH 1 1
75MRL-E-692 -1 RH 1 1
APPLICATION
QTY REQD
LIST OF MATERIALS
±1/32 .xx ±.031 .xxx ±.015 ±0°30'
MATL. ALUM. 2024-T6, 2075-T6 OR EQUAL
FINISH NOTE 2
RAY DICKEY
U.S. AIR FORCE REV. "A"
SUPPORT RISER
C
75MRL-C-697
FULL
1 OF 1
ENGINEERING DRAWING LAYOUT C


REVISIONS
LTR | DESCRIPTION | DATE | APPROVED
A | REVISED DIMENSIONING | 9-24-76 | WLF
25/64 (.390) DRILL THRU 4 HOLES.
#3 (.2150) DRILL THRU 2 HOLES.
-1 PLATE
.812
1.500 (REF)
.875
2.375
5.250
8.250
12.687
13.500
3.000
.625
.125
3 IDENTIFY WITH PART NO. (75MRL-B-698-1) WITH WATER-PROOF INK OR PAINT.
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
PARTS LIST
-1 | 75MRL-E-692 | 2 | 2
DASH NO. | NEXT ASSY | NEXT ASSY QTY | FINAL ASSY QTY
APPLICATION
±1/32 ±±.031 ±.015 ±0°30'
MAT'L. ALUM. 6061-T6 OR EQUAL
FINISH. NOTE 2
RAY DICKEY 15 DEC 75
U.S. AIR FORCE
REV. "A"
PLATE, EXTENSION
B
75MRL-B-698
FULL
AF FORM 1653
ENGINEERING DRAWING LAYOUT B

LTR	DESCRIPTION	DATE	APPROVED
A	REVISED DIMENSIONING	9-23-76	WLF



3 IDENTIFY WITH PART № (75MRL-B-699-1) WITH WATER-PROOF INK OR PAINT

2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I

1 REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

QUANTITY REQUIRED PER DASH NO. | SYM | NOMENCLATURE | CODE IDENT | IDENTIFYING NO | MATERIAL / SPECIFICATION | UNIT WT | ZONE | FIND NO

PARTS LIST

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-1	75MRL-E-692	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/32 DECIMALS .XX ±.031 .XXX ±.015 ANGLES ±0°-30'

MAT'L. ALUM 6061-T6 OR EQUAL

FINISH NOTE-2

RAY DICKEY 15 DEC '75

U.S. AIR FORCE

REV. "A"

TITLE BODY BELT, RESTRAINT

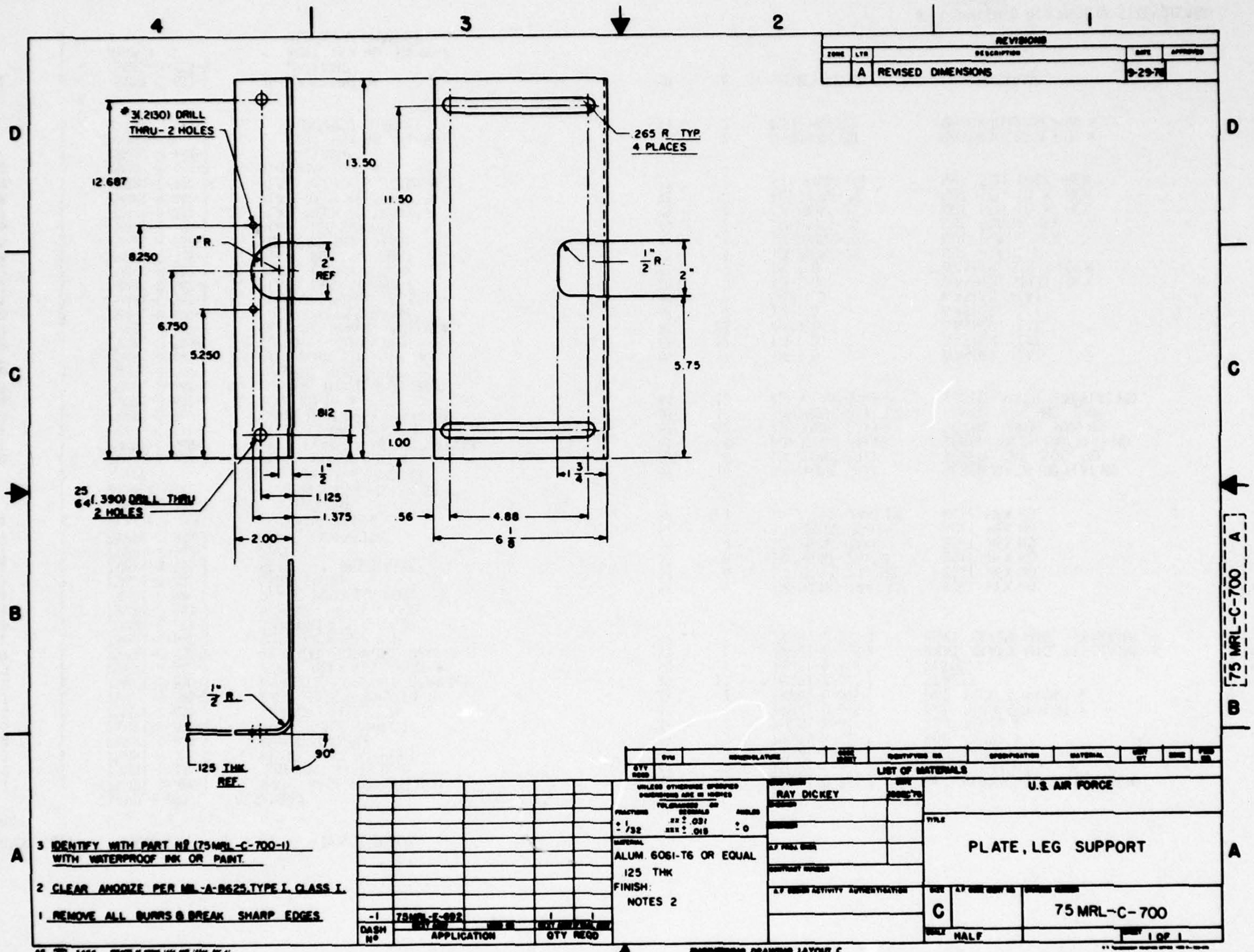
SIZE B

DRAWING NO. 75MRL-B-699

SCALE FULL SHEET 1 OF 1

AF 1653

ENGINEERING DRAWING LAYOUT B


REVISIONS
A REVISED DIMENSIONS 9-29-76
3(.2130) DRILL THRU- 2 HOLES
.265 R TYP 4 PLACES
13.50
11.50
12.687
8.250
6.750
5.250
1" R.
2" REF
1/2 R.
2"
5.75
.812
1.00
1/2
1.125
1.375
2.00
.56
4.88
6 1/8
1 3/4
25/64 (.390) DRILL THRU 2 HOLES
1/2" R.
90°
.125 THK REF
3 IDENTIFY WITH PART Nº (75MRL-C-700-1) WITH WATERPROOF INK OR PAINT.
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES
-1 75MRL-E-002
DASH Nº
APPLICATION
QTY REQD
LIST OF MATERIALS
ALUM. 6061-T6 OR EQUAL
.125 THK
FINISH:
NOTES 2
RAY DICKEY
U.S. AIR FORCE
PLATE, LEG SUPPORT
C
75 MRL-C-700
HALF
1 OF 1
ENGINEERING DRAWING LAYOUT C
75 MRL-C-700 A

APPENDIX A
INDEX

INDEX NO.	QTY.	PART NO.	DESCRIPTION
		75MRL-E-692-1	ASSEMBLY
1	1	75MRL-D-696-1	. RAIL, BASE SUPPORT R.H.
2	1	75MRL-B-444-1	. SUPPORT RISER R.H.
3	1	75MRL-D-693-1	. PLATE, BASE SUPPORT
4	1	75MRL-B-443-3	. SUPPORT ANGLE
5	1	75MRL-D-693-2	. PLATE, BASE SUPPORT
6	1	75MRL-B-444-2	. SUPPORT RISER L.H.
7	1	75MRL-D-696-2	. RAIL BASE SUPPORT L.H.
8	1	75MRL-C-550-3	. BRACKET, SUPPORT, REAR L.H.
9	1	75MRL-B-442-1	. PLATE, NECK RESTRAINT *
10	1	75MRL-C-550-1	. BRACKET, SUPPORT, REAR R.H.
11	1	75MRL-C-697-1	. SUPPORT RISER R.H.
12	1	75MRL-C-697-2	. SUPPORT RISER L.H
13	1	75MRL-D-553-1	. SUPPORT, RAIL & BASE
14	1	75MRL-F-694-1	. PLATE, BODY SUPPORT
15	2	75MRL-B-441-1	. STOP, GUIDE
16	2	75MRL-B-555-1	. SEAT BELT, RESTRAINT
17	1	75MRL-B-562-3	. PAD, SEAT
18	2	75MRL-B-698-1	. PLATE, EXTENSION
19	6	75 MRL-C-653-1	. U-CLAMP UNIT *
	1	75MRL-B-654-1	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL
20	4	75MRL-B-652-3	. PLATE, CLAMP MTG *
21	1	75MRL-C-568-1	. BKT., CLAMP MTG RESTRAINT *
22	2	75MRL-C-571-1	. STRAP CLAMP ASSY. *
23	1	75MRL-D-660-1	. GUIDE UNIT NECK RESTRAINT
24	2	75MRL-B-647-1	. ROD, GUIDE *
25	2	75MRL-B-648-1	. HOLDER, THDED, ROD GUIDE
26	2	75MRL-B-649-1	. WASHER, ROD GUIDE
27	1	75MRL-D-695-1	. PAD, BODY SUPPORT *
28	1	75MRL-D-545-1	. SUPPORT, GUIDE ADJ
29	1	75MRL-C-563-2	. BELT, RESTRAINT, ACCEL. *
30	2	75MRL-B-699-1	. BODY BELT RESTRAINT
31	2	75MRL-C-563-1	. BELT, RESTRAINT, ACCEL. *
32	1	75MRL-D-547-3	. PLATE, SEAT SUPPORT
33	2	75MRL-B-652-1	. PLATE, CLAMP MTG *
34	1	75MRL-C-548-3	. PLATE, FOOT SUPPORT
35	2	75MRL-B-554-1	. SUPPORT, SEAT PLATE
36	1	75MRL-C-700-1	. PLATE, LEG SUPPORT
37	1	75MRL-B-442-3	. PLATE-NECK RESTRAINT *
38	1	75MRL-B-442-5	. PLATE-NECK RESTRAINT *
39	1	75MRL-B-442-17	. PLATE-NECK RESTRAINT *
40	6	75MRL-C-653-3	. U-CLAMP UNIT *
	1	75MRL-B-654-3	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL
41	6	75MRL-C-653-5	. U-CLAMP UNIT *
	1	75MRL-B-654-5	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL

42	1	75MRL-C-568-3	. BKT, CLAMP MTG RESTRAINT *
43	2	75MRL-C-571-3	. STRAP CLAMP ASSY *
44	2	75MRL-B-647-3	. ROD, GUIDE *
45	2	75MRL-B-647-5	. ROD, GUIDE *
46	2	75MRL-B-647-7	. ROD, GUIDE *
47	1	75MRL-D-695-3	. PAD, BODY SUPPORT *
48	1	75MRL-D-695-5	. PAD, BODY SUPPORT *
49	14	76MRL-B-357-1	. SPACER
50	1	76MRL-B-356-1	. PLATE
51	1	75MRL-C-568-2	. BRKT, CLAMP MTG, RESTRAINT *
52	1	75MRL-C-568-4	. BRKT, CLAMP MTG, RESTRAINT *
53	5	3/8-16UNC-2Ax1 1/2	BOLT, HEX HD.
54	6	1/4-20UNC-2Ax 1/2	BOLT, HEX HD.
55	6	1/4-28UNF-2Ax3/4	BOLT, HEX HD.
56	4	1/2-13UNC-2Ax1"	BOLT, HEX HD.
57	2	5/16-24UNF-2Ax1"	BOLT, HEX HD.
58	4	1/4-20UNC-2A-1 1/4	BOLT, HEX HD.
59	10	3/8-16UNC-2Ax1"	SCREW MACH 100° FLAT HD.
60	8	1/4-20UNC-2Ax1"	SCREW, CAP, SOC. HD.
61	8	#10-32UNF-2Ax3/8	SCREW, MACH 100° FLAT HD.
62	12	#10-32UNF-2Ax3/8	SCREW, MACH. PAN HD.
63	12	3/8-16UNC-2Ax1 1/4"	SCREW, SOC. HD. CAP
64	10	#10-32UNC-2Ax5/8"	SCREW, MACH, 100° FLAT HD.
65	17	3/8-I.D.	WASHER, FLAT
66	12	1/4-I.D.	WASHER, FLAT
67	28	#10-I.D.	WASHER, FLAT
68	4	1/2-I.D.	WASHER, FLAT
69	2	5/16-I.D.	WASHER, FLAT
70	5	3/8-I.D.	WASHER, SPLIT-LOCK
71	2	1/4-I.D.	WASHER, SPLIT-LOCK
72	5	3/8-16UNC-2B	NUT, PLAIN, HEX
73	8	1/4-20UNC-2B	NUT, PLAIN, HEX
74	2	1/2-20UNF-2B	NUT, PLAIN, HEX
75	4	1/4-28UNF-2B	NUT, SELF-LOCK, HEX
76	10	#10-32UNF-2B	NUT, SELF-LOCK, HEX
77	2	5/16-24UNF-2B	NUT, SELF-LOCK, HEX
78	2	MS17990C330	QUICK RELEASE PIN *
79	2	MS17990C323	QUICK RELEASE PIN *
80	6	SERIES 215-U	TOGGLE CLAMP

* FURNISHED IN RANGE OF SIZES, USAGE OPTIONAL.

REFERENCES

1. Eisen, L. and R.S. Zeigen, "A Supine Seat for High-Stress Testing of Primates," WADC-TR-59-165, April 1959.

2. Dost, F.N., D.E. Johnson, and C.H. Wang, "A Restraint System for Squirrel Monkeys," AMRL-TR-71-126, May 1972.

3. Kazarian, L.E., and H.E. von Gierke, "Bone Loss as a Result of Immobilization and Chelation. Preliminary Results in Macaca mulatta," AMRL-TR-68-69, 1969.

4. Clark, K.A. and A.E. New, "Anthropometric Determinations of American Born Macaca mulatta," Naval Aerospace Medical Institute, Naval Aerospace Medical Center, Pensacola, Florida, NAMI-1078, July 1969.

5. Sostre, S., J.A. Kennealy, J. Kirkland, C.M. Oloff, A.A. Karl, and M.A. Franey, "Cerebral Blood Flow in Baboons Under Positive Acceleration," 1977 Annual Scientific Meeting, Las Vegas Hilton, Las Vegas, Nevada, May 9-12 1977.

6. Yoder, J.E., A.A. Karl, C.M. Oloff and K.J. Greenlees, "A Comparison of Invasive Techniques for Assessment of Cardiac Output Under Acceleration Stress," 1978 Annual Scientific Meeting, New Orleans Hilton, New Orleans, LA., May 8-11 1978.

7. Karl, A.A., A.T. Kissen, C.M. Oloff and S.L. Ward, "Validation of Suscutaneous Tissue PO_2 Determination as Indirect Assessments of Cerebral Tissue PO_2 in Rhesus," Federation Proceedings, 62nd Annual Meeting, Atlantic City, New Jersey, April 9-14 1978.

*U.S.Government Printing Office: 1979 — 657-002/328